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AUTHOR	Gray, Carmen P.; Forrest, Diane W.
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ABSTRACT

Fifteen interdisciplinary lessons on marine invertebrates (mollusks, echinoderms, and jellyfish) are provided in this unit designed for students in kindergarten and in grades 1 and 2. Each lesson includes lesson concept, competency goals, objectives, materials needed, background information, teacher preparation, and activities suitable for use in science, mathematics, language arts, reading, art, and music classes. Activities are designed to foster development of inquiry, manipulative, organizational, creative, measurement, and communicative skills while students learn about specific animals (starfish, clams, oysters, scallops, sand dollars, and jellyfish) and: (1) that aquatic organisms are adapted to their environment in different ways; (2) that water provides habitats and protection for living organisms; and (3) that water provides a source of food, raw materials, and energy for human consumption. A packet of materials to be duplicated for student use is included. (JN)

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PROJECT CAPE TEACHING MODULE

Developed under an ESEA Title IV-C Grant

Dare County Board of Education
P. O. Box 640
Manteo, North Carolina 27954

Dr. Carolyn H. Hampton
Project Director

William T. Martin
Curriculum Specialist

TITLE: A SEA CREATURE TREASURY

GRADE LEVEL: K-2

SUBJECTS: Language Arts, Reading, Science, Mathematics, Art and Music

SKILLS: Manipulative, Creative, Inquiry, Organizational, Communicative, Measurement

AUTHORS: Carmen P. Gray
and Diane W. Forrest

CONTRIBUTORS: Nellie Pridgen, Bonnie K. Temple, Robin Jackson

EDITOR: Carolyn H. Hampton

ARTIST: Alta Steed

PRODUCTION: Carol J. Autry

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School Administrators
Dare County Schools
Manteo, North Carolina

Superintendent
Mr. Stephen G. Basnight, Jr.

Assistant Superintendent
Mr. Willie E. Huber

Elementary Supervisor
Mrs. Jeannette Gard

Secondary Supervisor
Ms. Joyce Jordan

Consultants

Consultant
Dr. Ione Perry
Division of Development
North Carolina State Department
of Public Instruction
Raleigh, North Carolina

External Evaluator
Dr. P. Barry Hounshell
School of Education
University of North Carolina
Chapel Hill, North Carolina

Unit Reviewers

Mrs. Maxine Claar
Graham High School
Graham, North Carolina

Dr. Charles R. Coble
Department of Science Education
East Carolina University
Greenville, North Carolina

Dr. Ira Trollinger, Principal
South Mebane Elementary School
Mebane, North Carolina

Dr. Carol D. Hampton
Department of Science Education
East Carolina University
Greenville, North Carolina

Mr. Gerry Madrazo, Supervisor
Alamance County Schools
Graham, North Carolina

Mr. Rhett B. White, Director
North Carolina Marine Resources
Center/Roanoke Island
Manteo, North Carolina

Support Staff

Typist
Mrs. Robin Jackson

Production Assistant
Miss Doris O'Neal

A SEA CREATURE TREASURY

K-2b

A Unit on Marine Invertebrates

UNIT CONCEPTS

1. Aquatic organisms are adapted to their environment in different ways.
2. Water provides habitats and protection for living organisms.
3. Water provides a source of food, raw materials, and energy for human consumption.

PREFACE

The wonderful world of sea creatures can best come alive when one can actually visit the coast and have the experience of observing marine organisms in their natural state. Through the following lessons we have attempted to introduce students to this wonderful world of sea creatures. Hopefully these lessons about marine invertebrates will provide fun and excitement through instructional strategies in language arts, science, mathematics and art. A beach environment has been created to enhance the learning for children who do not live near the ocean. Perhaps they can imagine they are at the beach while learning about these sea creatures. Then, when they are able to visit a coastal area, they will find excitement and enjoyment in experiencing first-hand the knowledge acquired through A SEA CREATURE TREASURY.

-- Carmen Gray and Dianne Forrest

INTRODUCTION

Invertebrates are animals without backbones. Many animals that live in and around the water have no backbones. Water world invertebrates include univalve mollusks, bivalve mollusks, spiny-skinned animals and hollow cavity animals. We are going to study about some of these water world invertebrates in this unit.

Mollusks

Mollusks are animals without backbones and they have no spines. The word mollusk means soft. Mollusks have shell "houses" to protect their soft bodies. Their shells are their skeletons. Mollusks always carry their shells with them. There are approximately 100,000 kinds of mollusks in the ocean. Some mollusks live in fresh water and others on land. Some mollusks are as tiny as a grain of sand and others weigh hundreds of pounds.

The mollusk shell starts to grow when it is very young. The part of the body that does the most work is called the mantle. The mantle is the soft pad inside the shell. The edge of the mantle secretes a substance called lime mixed with a substance that makes the lime harden. The thickness of the shell depends on the number of coats the mantle makes. The new layers are added to the inside so the outside always looks the same. The mantle secretes the colors at the same time it is making the shell. No two mollusks make their "houses" alike. Their shells are all different. Some are scalloped and ribbed; some are smooth. Others are rough and ugly. A conchologist, a scientist who studies shells, can tell the shell's age by the growth rings that are on the shell.

There are five classes of mollusks. Two major classes of mollusks are bivalves and univalves. Bi- means two and -valve means fold. Each bivalve has two valves, or sections, to its shell. These two halves are held together by a hinge and they open and close like a book. The muscles which draw together the two parts of the bivalve shell are called the adductor muscles. The bivalve is unusual because it has no distinct head and the organs are arranged differently than most animals. The mouth is near the foot, the stomach lies above the mouth and the intestine passes through the heart. Most bivalves move by means of a thick muscular foot that is pushed out the bottom of the open shell. At the other end of the animal is a large pair of tubes called siphons. The siphons are used for taking in food and water. The bivalves remove oxygen from the water with their gills. The mantle that builds the shell also serves as a sense organ.

The second largest class of mollusks is the univalve. Univalve means "one-shelled." Most univalves have one shell which they carry on their back. Some have no shell such as the garden slug.

The foot of the univalve is a strong muscle. The animal is able to withdraw the foot and all other parts of its body and close the opening with a trap door called an operculum. The opening to the digestive tract is called the mouth and the edges are the lips. They have a head with eyes and organs of feel, taste and smell which are contained in two pairs of tentacles on the head. Also on the head is a mouth with a tongue-like organ called the radula. The radula is a grinding or rasping organ for tearing or cutting food. Like bivalves, most univalves breathe through gills. Those that live on land have sacs similar to lungs. Land univalves are snails. As the univalve's shell becomes too small, it builds a new and larger section to the original shell. Some univalves we will study are the conch, cowry, murex and oyster drill.

Spiny-skinned animals

The sea urchin is one type of spiny-skinned animal. Sea urchins are often mistaken for plants or flowers because they are so bright and beautifully colored. The sea urchin's skeleton is a shell. It is covered with spines that may be long or short, thick or thin. On the underside of the shell is the mouth which has five strong teeth. These teeth crush small mollusks, scrape up algae, and cut up seaweed. Sea urchins move on tube feet which are long and slender and have suction discs on the ends. Sea urchins can range from 1½" to 10" wide in diameter. Some sea urchins have poisonous spines.

Starfish or sea stars are another of the spiny-skinned sea animals. The starfish have from 5 to 50 arms and have the power to grow new arms if one is broken off or damaged. If a starfish is cut in two, each piece will regenerate into a new animal if a part of the brain is in each half. Most starfish are spiny with very tiny pinchers among their spines. Their bodies are central discs. Underneath the disc is a mouth. The starfish wraps its arms over a shellfish and uses the suction of its tube feet on the arms to force the shellfish open. They eat mussels, clams and oysters. Starfish destroy millions of dollars worth of shellfish yearly.

The sand dollar is another type of spiny-skinned animal. It is sometimes called a sea biscuit. It's disc is flat like a pancake and looks like a silver dollar in the sand. Sand dollars have very small, fine, silky moveable spines. The top surface has a set of breathing tubes arranged in the form of a five-point star. Sand dollars live in deep water, half buried in the sand. They feed on plankton and organic materials.

Hollow-cavity animals

The hollow-cavity animal that we are going to learn about is the jellyfish. The lessons on the jellyfish are concerned with identification and dangers. Jellyfish are very colorful and attractive. Therefore, children tend to pick them up when they find them washed onto the beach. One of the lessons contains a very clear explanation to students why they should avoid all types of jellyfish. Cautions and remedies to jellyfish stings are also included.

EXPLANATION OF CODING SYSTEM
FOR SUPPLEMENTARY MATERIALS

GRADE LEVELS AND SUBJECTS	CODE
K-2 Multidisciplinary	K-2a, K-2b, K-2c
3-4 Multidisciplinary	3-4a, 3-4b, 3-4c
5-6 Multidisciplinary	5-6a, 5-6b, 5-6c
SECONDARY SCHOOL	
English	ENG
Occupational Education	OE
Social Studies	SOC
Science	
Life	SC1
Earth	SC2
Biology	SC3
LESSON NUMBERS	
1	1.
2	2.
3	3.
etc.	etc.
SUPPLEMENTAL MATERIALS	
1	.1
2	.2
3	.3
etc.	etc.

EXAMPLES

K-2a
1.1 Translates: a supplemental sheet, booklet or game number 1 that accompanies the 1st lesson of Unit K-2a for grades K-2.

SC2
6.4 Translates: a supplemental sheet, booklet or game number 4 that accompanies the 6th lesson in Unit SC2 for earth science.

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Lesson Number: 1
Skills: Manipulative,
Creative,
Inquiry

THE MOLLUSK HOME

LESSON CONCEPT

Mollusks have shells that serve as their homes as well as protection for their soft bodies.

COMPETENCY GOALS

1. The learner will classify items according to a selected characteristic.
2. The learner will deal with numbers in a manner commensurate with his/her mental maturity.
3. The learner will enjoy learning activities related to concepts of science.
4. The learner will demonstrate the ability to observe.

OBJECTIVES

1. The learner will investigate mollusk shells.
2. The learner will identify some mollusk shells.

MATERIALS

live or dead shells, pictures of shells
yarn
construction paper
scissors
crayons
laminating film
paper bag
glue
blindfold
cardboard or file folder
brads

VOCABULARY

mollusk
shrimp
oyster
conch
scallop
fish
snail
bivalve
clam
mantle
crab
invertebrate

TEACHER PREPARATION

Become familiar with the mollusks used in this lesson for identification purposes. Reproduce copies of all the Supplementary Sheets so each child has one copy of each.

ACTIVITIES

1. IS THIS A MOLLUSK HOME? (Supplementary Sheet 1.1)

   Tell the children to place an X on the picture that is not a mollusk home. Have the children color them and display the sheets in the classroom or save them for a booklet at the end of the unit.

2. LET'S GO SHELLING (Supplementary Sheets 1.2 and 1.3)

   Let the children cut out the fish bowls and mollusks only. Color the mollusks and glue them in the fishbowl. Paste on colored construction paper and display in the classroom or have the children save them and put them in a folder for a booklet at the end of the unit.

3. HIDE AND SEEK

   Place shells in a paper bag. Blindfold one player at a time. Have the child reach into the bag and choose a shell to identify. Other objects may also be in the bag: paper clips, combs, pens, etc.

4. CAN YOU COUNT? (Supplementary Sheet 1.4)

   The object is to have the children match the mollusk pictures to the correct number. Draw a line from the number to the correct amount of mollusks. Have the children color their pictures. Display on a bulletin board or save for the child's folder at the end of the unit.

5. SEASHORE POETRY (Supplementary Sheet 1.5)

   Read the poem by Carmen Gray out loud. Divide the class into sections and let each section read one or two lines. Emphasize rhythm! If necessary, have the class clap their hands to keep rhythm. After this activity, have the children write and illustrate their own poetry. Again emphasize rhythm. Display their work on a school bulletin board or in the classroom. Save these poems for the booklet at the end of this unit.

QUESTIONS

1. A mollusk's home is it's ________.

2. __________, ____________ and ____________ are mollusks.

3. What protects a mollusk?

4. Can you name some other mollusks?

SOURCES

Abbott, R. Rucker. American Seashells. Princeton, New Jersey: D. Van Nostrand Company, Inc. 1954.

Buck, Margaret Waring. Along the Seashore. New York: Abington Press. 1964.

Low, Donald. Donald D. Wolf, editor. The How and Why Wonder Book of Sea Shells. New York: Grosset and Dunlap. 1961.

Ware, Kay. Let's Read About Sea Shells. St Louis, Missouri: Webster Publishing Company. 1957.

Lesson Number: 2
Skills: Manipulative,
Inquiry,
Creative

THE ENEMY LURKS!

LESSON CONCEPT

Mollusks (soft-bodied animals with shells) have many enemies.

COMPETENCY GOALS

1. The learner will use literature for self-expression.
2. The learner will discover relationships.
3. The learner will demonstrate the ability to classify.

OBJECTIVES

1. The learner will discover that shells protect the animals from hostile environmental conditions.
2. The learner will find out through creative role-play that the soft-bodied animals' shells protect them from their enemies.

MATERIALS

pictures of mollusks
scissors
laminating film
crayons
large roll of paper (for mural)
poster board
record The Rainy Day Record by Marion Cume and Nancy Curry selection "Aquarium." A Bomar Record

VOCABULARY

mollusk
conch
adductor muscles
oyster drill
clam
starfish
tentacles
snail
siphon
sea birds
predator
oyster
scallop

BACKGROUND INFORMATION

The mollusk has many enemies. At low tide, the mollusks are sometimes left exposed to the sun's rays. These rays would dry out their bodies if their shells were not there to protect them. Other enemies of the mollusks include:

- -a snail called an oyster drill which drills right through the oyster shell and sucks out its soft body
- -the starfish which fastens one or more of its arms to each half of an oyster's shell, pulling the two halves apart
- -sea birds which are found near the water use their strong bills to eat mollusks
- -an octopus eats snails and clams by wrapping its tentacles around the prey and crushing it open
- -a conch will attack some clams, oysters and scallops

A clam buries in the sand to protect itself from enemies. A siphon is extended to obtain food and oxygen. A scallop is so mobile that it can dodge and turn and make short dashes and even jump to avoid its enemies.

TEACHER PREPARATION

Reproduce copies of supplementary sheets 2.1 and 2.5 for each child in the classroom.

Prepare the playing board for AN ENEMY LURKS, supplementary sheet 2.2, by enlarging on poster board. Have the children color and decorate the board. The children may also color the objects or game pieces from supplementary sheets 2.2 and 2.3. Identify, on the back, each colored game piece as well as a letter indicating which it is: "F" for friend, "E" for enemy. Laminate the playing board and game pieces for durability.

ACTIVITIES

1. A STAGE SETTER MURAL

Make a mural of the ocean with fish, rocks and seaweed as a bulletin board or on a large sheet of paper. Let the children draw, color and cut out items for the mural, being sure to add soft-bodied animals; clams, scallops, snails, etc. Predators or enemies can be included in the mural. While designing the mural, discussion can be based around how the mollusk protects himself from the predator. Who are some of the predators and who are the mollusks? How do their shells protect them?

2. MY FAVORITE MOLLUSK (Supplementary Sheet 2.1)

Ask students to study the wall mural from Activity 1 and to select his/her favorite soft-bodied animal. Give each child a copy of supplementary sheet 2.1. Then, have the children draw, color and write a story or sentence explaining why they like that animal best. Variation at the Kindergarten level: Children can dictate to the teacher what they would like to say about their favorite mollusk after they have drawn it.

The teacher may wish to make an experience chart and use that in correlation with Activity 1. Use the experience chart as the basis for the class mural and glue the mollusk pictures to the chart. Or, display the children's art around the chart.

3. IMAGINATION

Play the record The Rainy Day Record by Marion Cume and Nancy Curry, selection "Aquarium," if available and have the pupils pretend they are various mollusks. "Open your shell when all is safe, come out of your shell. When danger is near, hide in the shell again." Pretend the classroom is the ocean. Tell the children to hover down like they are in the water and let their imaginations soar! Some may wish to be the enemies of the mollusks. Make imaginary actions of the ocean seem real. Parts could be given in advance or let the children create their own imaginary sea creatures.

4. AN ENEMY LURKS (Supplementary Sheets 2.2, 2.3, 2.4)

This game may be played individually or as a class. Have the children decide which of the game pieces are "enemies" and which are "friends" to the mollusk. Place the objects on the proper side of the playing board. The game is self-checking.

5. MATCH ME! (Supplementary Sheet 2.5)

This activity can be used as an evaluation of student response to this lesson. When all the statements have been matched to the correct drawing, have the children color the pictures.

SOURCES

Cavanna, Betty. The First Book of Sea Shells. New York: Franklin Watts, Inc. 1955.

Epstein, Sam and Beryl. Junior Science Book of Sea Shells. Champaign, Illinois: Gerrard Publishing Co. 1963.

Low, Donald. Donald W. Wolf, Editor. The How and Why Wonder Book of Sea Shells. New York: Grosset and Dunlap. 1961.

Lesson Number: 3
Skills: Manipulative,
Inquiry

ONLY ONE SHELL

LESSON CONCEPT

A univalve has one shell and a strong muscular foot.

COMPETENCY GOALS

1. The learner will demonstrate the ability to observe.
2. The learner will demonstrate the ability to experiment.
3. The learner will show increased vocabulary.

OBJECTIVES

1. The learner will discover that all univalves have one shell.
2. The learner will name some characteristics of univalves.
3. The learner will be able to identify some common univalves.

MATERIALS

various size conch and whelk shells   tag board   crayons

VOCABULARY

univalve
tentacles
oyster drill
one-shelled
radula
proboscis (siphon)
muscle
conch
operculum
cowry

BACKGROUND INFORMATION

See the introduction for information pertaining to univalves.

TEACHER PREPARATION

Familiarize yourself with the introduction of univalves and the illustration sheet for parts of a univalve. Reproduce copies of supplementary sheets 3.1, 3.2 and 3.3.

ACTIVITIES

1. THE OCEAN ROARS

A variety of conch or shelk shells of various sizes can be displayed at the science center. Tell the children to listen to one or all of the shells. Listen for the roar in the shell. The degree of loudness and softness in relation to the size of the shell can be charted. A pictorial chart of the shells placed at the science center will aid children in the identification of the univalve shell.

2. PARTS OF A UNIVALVE MOLLUSK (Supplementary Sheet 3.1)

Name the parts of the univalve mollusk with the children. If a live mollusk is available, allow the children to examine it. Find a color chart or model of the whelk's interior and let the children color their picture realistically.

3. FIND THE HIDDEN WORDS (Supplementary Sheet 3.2)

Let the children find the hidden words relating to the sea and sea animals including the conch and whelk. Have them circle the words they find in the maze of letters. They may decorate the supplementary sheet upon completion. Variation at Kindergarten level: Lead a discussion of the words on the worksheet. The teacher may have the words already circled for the children. They may decorate the worksheet.

4. ONLY ONE SHELL (Supplementary Sheet 3.3)

Use this activity to evaluate the children's response to this lesson.

SOURCE

Low, Donald. The How and Why Wonder Book of Sea Shells. New York: Grosset and Dunlap. 1961.

Lesson Number: 4
Skills: Organizational,
Inquiry

BIVALVE MOLLUSKS

LESSON CONCEPT

All bivalve mollusks have two shells.

COMPETENCY GOALS

1. The learner will show increased vocabulary.
2. The learner will use dictionary skills.
3. The learner will interpret pictorial materials.

OBJECTIVES

1. The learner will identify some common bivalve mollusks by playing the Beach Stroll game.
2. The learner will classify mollusks into two categories: univalve and bivalve.

MATERIALS

die
scissors
pennies
glue
poster board
crayons or colored markers
laminating film

VOCABULARY

bivalve
mantle
scallop
adductor muscles
mollusks
mussel
siphon
oyster
gills
clam

TEACHER PREPARATION

Reproduce copies of the Parts Of A Bivalve Mollusk, supplementary sheet 4.1. Read and familiarize yourself with the information about bivalves.

Enlarge on poster board, color and laminate the Beach Stroll game, supplementary sheet 4.3. The teacher may wish to laminate the game directions onto the back of the gameboard. Color, laminate, cut out and glue to pennies the game tokens shown at the bottom of supplementary sheet 4.2. Place the Beach Stroll game in a science interest center.

Enlarge on poster board, color and laminate the Seashore Syllable game, supplementary sheet 4.5. The teacher may wish to laminate the game directions onto the back of the gameboard. Color, laminate, and cut out the shell playing pieces from supplementary sheets 4.6, 4.7, and 4.8. The game can be self-checking by placing the answer (the number of word parts or syllables) on the back of each shell before laminating. Place this game in a language arts interest center.

Reproduce copies of the Mollusk Puzzle, supplementary sheet 4.9, for student evaluation.

ACTIVITIES

1. "BI" MEANS TWO (Supplementary Sheet 4.1)

   Give the students a copy of Parts Of A Bivalve Mollusk. Name the parts of a bivalve mollusk with them. Obtain a fresh bivalve such as a clam or oyster. Let the children examine the animal. Open the shell to see the animal. Obtain a colored picture of the internal organs of the bivalve animal. Let the children color the activity sheet as realistically as possible.

2. BEACH STROLL GAME (Supplementary Sheets 4.2 and 4.3)

   Directions for playing this game are given on supplementary sheet 4.2.

3. SEASHORE SYLLABLE GAME (Supplementary Sheets 4.4 - 4.8)

   Directions for playing this game are given on supplementary sheet 4.4.

4. MOLLUSK PUZZLE (Supplementary Sheets 4.9)

   Use this activity to evaluate the children's response to this lesson.

SOURCES

Low, Donald F. The How and Why Wonder Book of Sea Shells. New York: Grosset and Dunlap. 1961.

Cavanna, Betty. The First Book of Sea Shells. New York: Franklin Watts, Inc. 1955.

Lesson Number: 5
Skills: Manipulative,
Measurement,
Inquiry

CLAMS

LESSON CONCEPT

Clams are edible bivalve mollusks.

COMPETENCY GOALS

1. The learner will develop observational skills.
2. The learner will select and safely use work objects.
3. The learner will read for information in order to respond to factual questions based on printed material in the target language.

OBJECTIVES

1. The learner will name some characteristics of a clam.
2. The learner will discover that clams are edible.
3. The learner will cooperate with one another by sharing responsibilities.

MATERIALS

clam chowder recipe ingredients and necessary cooking utensils
crayons

VOCABULARY

mollusk bivalve spine hinge gills mantle quahog
wampum

BACKGROUND INFORMATION

Clams are bivalve mollusks. Bivalves are covered by two shells, or valves, which are joined at the top by a hinge. The clam has a foot to help it move. Two siphons stick out the opposite end. One siphon takes in water and the other passes it out. This water provides food and oxygen for the clam's existence. Clams remove oxygen from the water by their gills. The shell is made by the mantle, a membrane that covers the body. It removes lime from the water and secretes a substance that forms the shell. The more lime that is added, the heavier the shell becomes. Clams can be of various shapes and sizes. Some are colorful and some are not. Some clams have hard shells and others have soft shells.

Clams are very appetizing. Clams were used as food by the Indians and have been eaten ever since. Clams are eaten raw, steamed and in chowders. The hard shell clam called the quahog, was not only a favorite food for the Indians, but was also used as money. The Indians carved beads and discs called wampum from these hard shell clams. These quahog shells are grayish white in color. The inside of the shell is white with a purple border at the edges.

TEACHER PREPARATION

Reproduce copies of supplementary sheets 5.1 and 5.2.

Make a chart of the clam chowder recipe for use with activity 2. Obtain ingredients and utensils needed for the preparation of this recipe.

ACTIVITIES

1. I AM A BIVALVE MOLLUSK (Supplementary Sheet 5.1)

   Read about clams during story time or science class. The teacher may want to refer the children to supplementary sheet 4.1--Parts Of A Bivalve Mollusk. Give each child a copy of the clam picture to color, discuss and label (hinge, foot, shell, siphons).

2. CLAM CHOWDER--OUTER BANKS STYLE

   Read the recipe and the directions to the class. Have the class read with you.

CLAM CHOWDER RECIPE

six (6) clams (chopped or ground)
   may substitute two (2) small cans of
   minced clams
six (6) medium potatoes
three (3) medium onions
three (3) quarts of water
one (1) teaspoon salt
pepper to taste
two slices of bacon

Cooking Directions:

a. Prepare clams by opening the shells. Scoop out the meat with a knife.

b. Cut up the clams into small pieces with scissors or grind them.

c. Peel and dice potatoes and onions.

d. Place all ingredients, except clams, in a pot with three quarts of water. Simmer until the potatoes and onions are tender. Add clams and cook five minutes longer. Serve in cups when cool enough to eat.

Assign small groups of children to task stations to prepare chowder.

Prepare the clam chowder and have everyone try a cup. It's delicious.

3. CLAM PUZZLE (Supplementary Sheet 5.2)

Use this activity as an evaluation of the children's response to this lesson. Vocabulary words must fit the puzzle as well as the sentence of the same number. Students may complete the activity by coloring the sea animal pictures.

SOURCES

Low, Donald F. The How and Why Wonder Book of Sea Shells. New York: Grosset and Dunlap. 1961.

Lesson Number: 6
Skills: Manipulative,
Inquiry

CLAM SIPHONS

LESSON CONCEPT

A clam has two siphons; one lets water pass in and the other lets water pass out.

COMPETENCY GOALS

1. The learner will demonstrate the ability to observe.
2. The learner will demonstrate the ability to experiment.

OBJECTIVES

1. The learner will observe a clam to see the siphons and how they function.
2. The learner will draw a picture of the clam showing how the water passes in and out of the siphons.

MATERIALS

plastic container (food container)
food coloring
clam
natural sea water or salt water
synthetic sea salts for making salt water
(follow directions on package)

synthetic sea salts are
available from:
Carolina Biological Supply
Raleigh, North Carolina 27215

BACKGROUND INFORMATION

Water enters and leaves the clam through its siphons. A clam has two siphons. One siphon lets water come in. This water carries oxygen and food. The water passes over the gills and provides oxygen for the clam. The old water is expelled through the other siphon. Waste products are carried out with the water.

TEACHER PREPARATION

Obtain a live clam from the sound or ocean. Place the clam in a plastic container of natural sea water or synthetic sea water.

ACTIVITIES

1. CLAM SIPHONS

   a. Place enough sea water in the plastic container to cover the clam.

   b. Allow the clam to relax. It will extend its siphons.

   c. Partially fill a bottle with sea water and then add 2-4 drops of food coloring to the water in the bottle. Shake to mix.

   d. Very carefully place a drop of the colored water near the siphons and observe the results.

   e. Be careful not to add too much of the colored water or the results will be masked.

   f. Keep adding drops if needed. Observe the "pulling in" of the water and the "shooting out" of the water.

   g. Ask the students to draw a picture of the clam indicating the flow pattern of the water through the siphons.

REFERENCE

Outdoor Biology Instructional Strategies. "Water Breathers." Lawrence Hall of Science, University of California, Berkley, California.

Lesson Number: 7
Skills: Inquiry,
Manipulative

OYSTERS

LESSON CONCEPT

Some oysters are commercially grown in seed beds where they are nurtured until they reach marketable size.

COMPETENCY GOALS

1. The learner will understand that living things grow, develop, reproduce and die.
2. The learner will enjoy learning activities related to concepts of science.

OBJECTIVES

1. The learner will discover the growth pattern of an oyster from a baby through adulthood.
2. The learner will find out how the oyster receives nourishment.

MATERIALS

aquarium
sea salts
algae
live oysters, if possible

VOCABULARY

oyster
fertilized
spawn
plankton
adductor muscle
seed oyster
sperm
starfish
gills
oyster drill

BACKGROUND INFORMATION

During the warm months of summer, conditions and temperature of the salt water cause the oyster to spawn. The male releases sperm into the water. The female oyster releases her adductor muscle causing her to spawn by releasing thousands of eggs which are fertilized by the sperm. This will trigger many oysters to do the same and millions of oysters will be spawning at the same time. If the baby oyster survives (not being eaten by plankton and feeding sea animals, or destroyed by water pollution, strong water currents and water temperatures) the embryo hatches into larvae forming two valves. This oyster's size is very tiny. Two hundred could cover the face of one penny. In about two weeks, a tiny foot developes which the oyster will use on the sea floor. The oyster stops swimming and drops to the bottom testing a suitable place for attachment using this new foot. It may move many times before it finds a suitable place to live. The oyster squeezes out a glue-like liquid from its foot. Then, it attaches to a clean inviting place such as another large oyster shell. At this time, the oyster's swimming parts (hairy cilia around the shell), as well as its foot, have disappeared. New food collectors and gills develop. The gills are provided with cilia and serve as miniature water pumps. As they pump water, they strain out tiny living organisms called plankton. The oyster eats much plankton. Eventually it will pump 50 gallons of water each day. There is rapid growth at this stage and within eight months, the oyster will be one inch in diameter. It is at this point of growth that the oyster is called a seed oyster. The seed oyster retains this name until it reaches a marketable size.

At the end of one year, now the size of a silver dollar, many oysters are moved from their original place to a growing ground where they are in a protected environment until they are ready for market. They can be moved by means of tongs digging deep into the mud, hoisted to a boat, and then moved to a new oyster bed. The new bed will have firm ground and enough mud to keep waves and strong currents from shifting the bottom. All conditions are good in this new bed except for the oyster's natural enemies. The foremost is the oyster drill. The oyster drill bores a hole in the oyster's upper valve, extends its feeding tube through the hole, and devours the oyster's body. Another equally dangerous enemy is the starfish. It wraps its body around the oyster and pulls open the two valves of the shell. The starfish pushes its stomach inside out and surrounds the soft flesh of the oyster. The oyster cannot use its usual defense of keeping its valves tightly shut due to the force of the starfish's pull. Crabs are another enemy of the oyster. If the oyster survives these enemies, at about the age of three, it is ready for market. A boat with a dredge will lift the oysters from the bed, hoist them onto the boat and take them to market to be sold.

TEACHER PREPARATION

Set up an aquarium in the classroom. See Activity 1--Classroom Aquarium, for additional information.

Plan a trip to a coastal community, if possible.

Obtain oysters for use in Activity 3--Let's Eat Oysters.

Prepare the gameboard for See The Sea Animals by enlarging on poster board, coloring and laminating supplementary sheet 7.2. The teacher may wish to laminate onto the back of the gameboard the game directions, supplementary sheet 7.1. Color, laminate and cut out the game cards, supplementary sheets 7.3 and 7.4. Gather small shells, pennies or paper cut outs for use as game tokens.

ACTIVITIES

1. CLASSROOM AQUARIUM

Purchase sea salts for the water. Attempt to recreate the oyster's environment. If using chlorinated water, a chemical can be purchased at a local pet store to remove the chlorine. Obtain algae (green plants suited for an aquarium). Purchase or collect 2 or 3 oysters and place them in the aquarium. Children will experience first-hand the movements of the oyster, opening and closing of the valves, eating habits and other joys of caring for a live animal.

2. FIELD TRIP

Actually see oysters, touch and taste them. Visit an oyster shucking factory or oysterman's boat. Tour any premises having to do with the life of the oyster.

3. LET'S EAT OYSTERS

If oysters can be obtained, try experimenting with tasting oysters. They can be eaten raw, steamed, stewed or fried. If attempting to open oysters yourself, you should consult a cookbook or manual as to the best method of opening the shells.

A. SHUCKING OYSTERS

Cotton gloves and an oyster knife are needed to shuck oysters. Never use a sharp knife.

1. Rinse the oyster thoroughly.
2. Grasp the oyster by the thin end or "bill."
3. Insert the oyster knife into the crevice between the shells at the hinge. Twist the knife while pushing it into the crevice to cut the hinge.
4. Slide the knife along the inside of the top shell and cut the adductor muscle loose from the shell. Remove the top shell.
5. Slip the knife under the oyster and cut the muscle away from the bottom shell.

B. OYSTER STEW

Ingredients: 1 pint of oysters
1/4 cup melted margarine or butter
1 quart of milk
1½ teaspoons salt
1/8 teaspoon pepper
paprika

Cook oysters in oyster liquor for 3 to 5 minutes or until edges begin to curl. Add milk, margarine, salt and pepper. Heat thoroughly, but do not boil. Garnish with paprika. Makes 6 servings.

4. SEE THE SEA ANIMALS GAME (Supplementary Sheets 7.1 - 7.4)

The game covers various sea animals including the oyster. Children move their tokens by drawing a card and correctly naming the sea animal. Children move to the beginning consonant letter of the playing card after the animal is identified. If the answer is incorrect, the player may not move the token forward.

SOURCES

Florida Seafood Basics and Beyond, available from Bureau of Marketing and Extension Services, Divison of Marine Resources, Department of Natural Resources. Crown Building, 202 Blount Street, Tallahassee, Florida 32304.

Cook, Joseph H. The Changeable World of the Oyster. New York: Dodd, Mead and Company. 1974

Bailey, Robert S. and Fred C. Biggs. The Adventures of Little Oyster. Gloucester Point, Virginia: Virginia Institute of Marine Science.

Lesson Number: 8
Skills: Manipulative,
Communicative,
Creative

SCALLOPS OR PECTENS

LESSON CONCEPT

The scallop is a sea animal with two names and it is good to eat.

COMPETENCY GOALS

1. The learner will demonstrate the ability to observe.
2. The learner will develop skills in singing.
3. The learner will understand the basic characteristics of animals.

OBJECTIVES

1. The learner will describe some of the characteristics of scallops.
2. The learner will exhibit a desirable attitude by tasting a scallop.

MATERIALS

empty canister such as a tennis ball or potato chip tube can
can cover and information strips (Supplementary Sheets 8.1 and 8.2)
copies of the song sheet OCEAN (Supplementary Sheet 8.3)
copies of evaluation activity (Supplementary Sheet 8.4)

VOCABULARY

scallops pectens mollusks adductor byssal threads mantle

BACKGROUND INFORMATION

The adult family of scallops or pectens, bivalve mollusks, are quite active swimmers. The young ones are attached by byssal threads to something stationary. These adult bivalve mollusks can propel themselves through the water like a rocket, in a zigzag motion. The animal moves by opening and closing its two valves quickly forcing water between them. The edible part is the powerful adductor muscle that snaps the valves shut. Scallops or pectens have a row of tiny eyes located at the edge of the mantle. They may have as many as 120 eyes. These mollusks may be different colors. Their fan-shaped shells may be ribbed or scalloped. They may vary in size from 1 to 8 inches. Either valve of the scallop or pecten may have "wings" or "ears" that stick out on either side near the hinge.

TEACHER PREPARATION

Prepare a game using an empty tennis ball or potato chip tube can. Decorate the can and cut a slit in the plastic lid. Cut out and laminate the strips included with this lesson for the activity DID YOU KNOW? (see supplementary sheets 8.1 and 8.2). Prepare copies of the song "OCEAN" and the evaluation sheet "Scallops or Pectins" (see supplementary sheets 8.3 and 8.4).

ACTIVITIES

1. LET'S TASTE A SCALLOP

Obtain a live scallop or some scallop shells. Let the children examine the scallop or scallop shells. Scallops have an oversized adductor muscle which furnishes a lean, white meat that is delicious. Scallops may be poached, baked, broiled or fried. Try broiling some scallops for the children to taste. If you have a small counter top broiler, oven or toaster, you can broil scallops in the classroom.

BROILED SCALLOPS

2 pounds of scallops
½ cup butter or margarine
3/4 teaspoon salt
1/8 teaspoon white pepper
Paprika
Garlic

Rinse the scallops with cold water. Melt butter in a small saucepan. Add garlic and cook over a very low heat for 5 minutes. Do not brown garlic. Place scallops in a single layer in a baking dish (11" x 7½" x 1"). Sprinkle scallops with salt and pepper. Pour garlic butter over scallops and stir to coat them on all sides. Broil about 4 inches from the source of heat for 2 minutes. Stir scallops and broil 2 minutes longer. Sprinkle with paprika and serve immediately. Makes 6 servings.

2. DID YOU KNOW? (Supplementary Sheets 8.1 and 8.2)

Have the children play the game "Did You Know?" Answer the questions one at a time and check the answer by pulling the strip up to the next question. The answer for the previous question will be on the back of the next question on the strip. If the children miss many of the questions, have them try the same strip again.

3. OCEAN SING (Supplementary Sheet 8.3)

This song is written to the tune of BINGO. "There was a farmer who had a dog and Bingo was his name O!" etc. Have the children sing this in class. Each time you sing a verse, leave out a letter of OCEAN. You may wish to have the children clap their hands, stomp their feet, or even hum the letter they leave out.

4. SCALLOPS OR PECTENS (Supplementary Sheet 8.4)

Use this activity to evaluate the children's response to this lesson.

REFERENCE

Florida Seafood Basics and Beyond. Bureau of Marketing and Extension Services, Division of Marine Resources, Department of Natural Resources.

Lesson Number: 9
Skills: Inquiry,
Manipulative,
Creative

THE OCTOPUS

LESSON CONCEPT

The octopus is a soft-bodied animal with unique characteristics.

COMPETENCY GOALS

1. The learner will demonstrate adequacy of visual discrimination and memory.
2. The learner will recognize and use words specifically related to content areas.
3. The learner will understand that all objects can be classified and/or described by their properties.

OBJECTIVES

1. The learner will name some physical characteristics of the octopus.
2. The learner will discover the protective adaptations of the octopus.
3. The learner will find out the manner in which the octopus moves through the water.

MATERIALS

picture of octopus
crayons
poster board
paper bag
books with pictures of octopuses
laminating film

VOCABULARY

octopus
shallow
tentacles
siphons
jet propulsion
suction cups - discs

BACKGROUND INFORMATION

The octopus is the most highly developed soft-bodied animal. The octopus ranges in size from 1 inch to 28 feet. It gets its name from the fact that it has eight arms or feet. Contrary to its reputation, the octopus is actually very timid. The octopus has two methods of protecting itself; one way is to blend into the environment. It does this by changing its colors from yellow to green to red to brown. The other way is to eject an inky fluid which it can hide behind or within. The octopus uses its arms to move slowly about the sea bottom. To escape enemies the octopus can move rapidly by taking in water and squirting it out through a siphon. The mother octopus treats her eggs in an unusual way. She finds a hiding place, builds a nest, and deposits thousands of eggs. She then cares for them by stroking and cleaning them.

TEACHER PREPARATION

Make copies of supplementary sheets 9.1 and 9.2. Make the game "Feed The Octopus." Reproduce the gameboard and enlarge it. Write the answers on the gameboard in different colors. Cut out a hole for the octopus' mouth. Mount, laminate and cut out the question cards, supplementary sheets 9.4 and 9.5. Color code the question card to the color of the answer on the gameboard.

Make the Ollie Octopus puzzle by coloring and laminating supplementary sheets 9.6 and 9.7. Cut supplementary sheet 9.7 into puzzle pieces.

ACTIVITIES

1. OCTOPUS! (Supplementary Sheets 9.1 and 9.2)

   Four statements pertaining to the octopus are made on the supplementary sheet. Questions are asked about the statements. Read the statements with the class. Answer the questions and write the words in the blanks. Draw a picture of the octopus and color it. Draw the place where the octopus lives.

2. FEED THE OCTOPUS (Supplementary Sheets 9.3 - 9.5)

   Children answer a question, check their answer, and feed the octopus. Place the game in an interest center in the classroom.

3. OLLIE OCTOPUS (Supplementary Sheets 9.6 and 9.7)

   This is an octopus puzzle game. The children place puzzle pieces correctly on the original picture to make another picture of Ollie.

4. QUESTIONS

   Use the questions from the game "Feed The Octopus" to evaluate students' response to this lesson.

SOURCES

Buck, Margaret Waring. Along the Seashore. New York: Abingdon Press. 1964.

Selsam, Millicent E. Animals of the Sea. New York: Four Winds Press. 1975.

White, Mel, Editor. North American Sea Life Coloring Album. San Francisco, California: Troubador Press. 1973.

Lesson Number: 10
Skills: Measurement,
Manipulative,
Communicative

THE SEA URCHIN

LESSON CONCEPT

The sea urchin is a spiny-skinned animal.

COMPETENCY GOALS

1. The learner will deal with numbers in a manner commensurate with his/her mental ability.
2. The learner will demonstrate adequate comprehension skills.
3. The learner will understand that all objects can be classified and/or described by their properties.

OBJECTIVES

1. The learner will be able to identify the sea urchin.
2. The learner will identify some general characteristics of the sea urchin.

MATERIALS

toothpicks
clay or play dough
clothes pins
styrofoam balls (any size 1½" - 10")
tag board
laminating film

VOCABULARY

sea urchin algae spines vegetarian tube feet

BACKGROUND INFORMATION

The skeleton of the sea urchin is a shell made of small lime plates joined together. The sea urchin has movable spines, which cover most of its shell. These spines protect the sea urchin and help it walk as if on stilts. There are five bands of tube feet which are located around the shell between the spines. These tube feet have suction discs on the ends. In the center on the bottom side of the urchin, there is a mouth with five pointed teeth. The teeth come together at a central point which helps the sea urchin scrape food. The urchin can crush small mollusks, seaweed and algae. The sea urchin is mostly a vegetarian.

Sea urchins are found along the coast. They may be 1½" to 10" across. They vary in colors: red, green, white, brown, purple or yellow. Sea urchins may be found in either shallow or deep water. Sea urchin's spines are sharp so care should be taken not to step on one. Some sea urchins in the tropics have poisonous spines.

Sea urchins are a delicacy to eat in Europe and South America. Their taste is similar to caviar.

TEACHER PREPARATION

Obtain styrofoam balls. You will need half as many as the number of students in your class. Cut the styrofoam balls in half. They are now ready for spines. Read the background information to the children. Find stories about spiny-skinned animals to place in a center area. Read the stories to the children. Make copies of "Let's Pretend," supplementary sheet 10.1. Prepare math counting cards, supplementary sheets 10.2 - 10.4, by cutting out and laminating them.

ACTIVITIES

1. A LIVE BALL?

Children can make a model of a sea urchin by using a styrofoam ball. Cut the styrofoam balls in half. Toothpicks may be used for spines. These should be painted or colored the color of a sea urchin. Children then place painted toothpicks all around the styrofoam ball to make their own sea urchin. On the bottom of the ball, they can designate the mouth. Sea urchins can be displayed at the science center, as a mobile or attached to an ocean mural scene!

2. CLAY SEA URCHINS

Children can design their own sea urchins by using modeling clay or play dough. Have the children form shapes to resemble the sea urchin. Other spiny-skinned animals may also be made to go along with the sea urchin and then displayed. Children may write an experience story to go with their models.

VARIATION--Kindergarten level: Read the background information to the children. Read the stories about spiny-skinned sea animals. Have the children dictate an experience story and transfer the story to a chart. Display the models and the story.

3. LET'S PRETEND (Supplementary Sheet 10.1)

Give each child a copy of the activity sheet. Ask the children to pretend they are visiting the ocean and viewing various sea creatures. Much oral discussion will arise from the pictures and their surroundings. Use the following directive statements to determine the child's ability to identify the animals in the picture.

a. Color the starfish purple.
b. Put an X on the largest sea urchin.
c. Circle all the sand dollars.
d. Underline all the things that begin with the letter "s."
e. Color the smallest sea urchin yellow.
f. Color all the snails brown.

4. CAN YOU COUNT? (Supplementary Sheets 10.2 - 10.4)

The children name the sea animals on the card, then place the correct number of paper clips to correspond with the number of sea animals on that card. On the back of each card, the ordinal and cardinal numeral is given. This activity gives the children practice in number recognition and counting.

SOURCES

Buck, Margaret Waring. Along the Seashore. New York: Abington Press. 1964.

Lubell, Winifred and Cecil. By the Seashore. New York: Parents' Magazine Press. 1973.

Lesson Number: 11
Skills: Inquiry,
Communicative,
Creative

DOLLARS IN THE SAND

LESSON CONCEPT

The sand dollar is a spiny-skinned animal.

COMPETENCY GOALS

1. The learner will understand that living things exhibit basic similarities and differences.
2. The learner will discover relationships.
3. The learner will develop concepts of the characteristics of animals.

OBJECTIVES

1. The learner will be able to explain the pattern on top of a sand dollar.
2. The learner will discover that a sand dollar is a living animal.

MATERIALS

construction paper
chart paper
yarn for mobile hanging

VOCABULARY

sand dollar
pattern
spines
tube feet
sea urchin

BACKGROUND INFORMATION

The sand dollar is a relative of the sea urchin. It usually lives partly buried in the sand. The sand dollar is found off the southeast coast of North Carolina. People refer to sand dollars as cookies in the sand or sea biscuits because of their flat thin appearance. Sand dollars have a pattern on their top side that looks like five petals. The petal-like figures are filled with slots and holes that lead to many breathing tubes. The shell is covered by fine short spines which help the sand dollar move about. It has tube feet like a sea urchin and these tube feet stick out through tiny holes on both sides of the thin, flat shell. On the bottom of the sand dollar there is a mouth, like the sea urchin, with five pointed teeth.

TEACHER PREPARATION

Obtain examples of sand dollars or find books with pictures of sand dollars, sea urchins, shells, etc. Read about the sand dollar and explain to the children that the ones we find on the beach are only the remainder of what was an animal. They are only shells. Make copies of the sand dollar picture. To make Sea Biscuits, use a flour, salt and water mixture to make a dough. Give each child a small piece of dough to work with.

Salt Dough Recipe

1 cup flour	enough warm water to make a workable dough
2 cups salt	(approximately 3/4 cup)

Mix the dry ingredients together. Make sure the mixture has no lumps. Gradually add the water until the dough becomes workable. This may be done ahead of time and kept in a covered container in a refrigerator until ready for use. Keep all the unused dough in the refrigerator for use at another time.

ACTIVITIES

1. SAND DOLLAR ART (Supplementary Sheet 11.1)

   Have the children decorate and color a picture of a sand dollar. They may wish to write a story or dictate a sentence about the sand dollar. You may wish to use the sand dollar with other sea animals to create a mobile. For example, use a starfish, snail and sand dollar in the mobile. See activity sheet 11.1 for a sand dollar pattern. Ask the children to bring specimens of sand dollars or sea urchins, if available, to the class to see. Read about the sand dollar.

2. SAND DOLLAR

   Write the word sand dollar on the board. Tell the children to think of the names of sea animals that begin with the same letters in the word on the board.

3. SEA BISCUITS

   Give each child a small amount of sea biscuit dough. Have the children pat out a sand dollar. Etch lines into the sea biscuit with a paper clip. Be sure to make the lines obvious. Bake the sea biscuits until they are hardened. You may wish to have the children paint the sand dollars with any color they like.

REFERENCES

Buck, Margaret Waring. Along the Seashore. New York: Abington Press. 1964.

Lubell, Cecil and Winifred. By the Seashore. New York: Parents' Magazine Press. 1973.

Lesson Number: 12
Skills: Organizational,
Creative,
Inquiry

STARS OF THE SEA

LESSON CONCEPT

The starfish is a spiny-skinned animal that lives in the ocean.

COMPETENCY GOALS

1. The learner will be able to clarify and organize ideas and feelings before writing.
2. The learner will understand that there are many kinds of living things.
3. The learner will enjoy learning activities related to concepts of science.

OBJECTIVES

1. The learner will discover some of the physical characteristics of the starfish.
2. The learner will discover how the starfish lives in its environment.
3. The learner will identify the enemies of the starfish.

MATERIALS

starfish activity sheet
Can You Fill My Balloon gameboard
starfish pattern
blank cassette tape
rings or paper fasteners

VOCABULARY

crustaceans
tube
mollusks
ocean
starfish
discs
fish
rays
menhaden

BACKGROUND INFORMATION

Starfish live in the ocean. They like to move along the bottom of the sea. They also live in pools near rocks in the water. Starfish may be green, purple, orange, red, brown or yellow. Many starfish have five arms, but others may have from 10 to 50 arms. If one of the starfish's arms or rays is cut off, it will grow another. Or if its body is cut in two, both halves will grow into an entire body if a part of the ganglia (brain) is in each half. This is called regeneration. On the bottom of each arm the starfish has many little feet that look like tubes. The starfish walks on rocks with these tube feet. The starfish has a small hole on the top of its body. Water runs into this hole and through the starfish's body to help him move. At the end of each arm or ray, there is a spot which is an eye. These eyes do not see shapes, they only detect light. The mouth of the starfish is on the bottom of its body. When it feeds on an animal, the starfish turns its stomach inside out. The stomach comes out of its mouth and the starfish digests the animal.

The starfish eats mollusks, crustaceans and any small animal that is dead or injured. The amount it eats varies according to the availability of food. It will even eat other starfish if there is nothing else to eat. The starfish's enemies are fish, particularly menhaden, and sea birds.

TEACHER PREPARATION

Read and discuss the information presented in the Background Information and Introduction to the unit to the class. Reproduce supplementary sheets 12.1, 12.3 and 12.9.

After the children have completed the booklet of their feelings about the starfish, fasten it with rings or paper fasteners.

Prepare the game Can You Fill My Balloon?, supplementary sheet 12.4. Enlarge the gameboard. Color code the balloons on the board to the starfish answer cards, supplementary sheets 12.7 and 12.8. Glue question cards, supplementary sheets 12.5 and 12.6, to the balloons on the gameboard. Decorate and laminate for durability the gameboard and answers. Make a cassette tape with the directions on how to play the game. Allow time for the students to respond by matching the answer card to the question. Then repeat the question and give the correct answer.

ACTIVITIES

1. DO I BELONG? (Supplementary Sheet 12.1)

Have the children follow the directions on the picture work sheet included with this lesson. They are to circle all of the pictures that concern the facts learned about the starfish. Directions are given on activity sheet 12.1.

2. STARFISH BOOKLET (Supplementary Sheets 12.2 and 12.3)

Let the children make an "I like the starfish ________________" as a class activity. The book is in the shape of a starfish. Each child will add his/her own page to the book by writing way he/she likes the starfish or something about the starfish. Let the children illustrate their page of the book. Combine the pages to make a book and place it in the library center or science center. The book could also be an entry in the school science fair.

3. CAN YOU FILL MY BALLOON? (Supplementary Sheets 12.4 - 12.8)

Have the children play the game in small groups. Instruct the class to "listen to the tape cassette with the game and follow the directions. Each question on the gameboard will be on the cassette tape. Check your answer by listening to the answer on the tape and matching the answer given with the correct starfish."

4. STARS OF THE SEA (Supplementary Sheet 12.9)

Have the children color the ocean scene of the starfish in it's environment. Activities may include writing the word on the color sheet or counting the marine organisms in the picture and writing the correct number on the picture. Write an experience to go with the picture.

QUESTIONS

1. Where do starfish live?
2. Starfish like to move along the ________________.
3. How many different colored starfish are there?
4. Most starfish have ____________ feet.
5. What is another name for a starfish's arm?
6. What is on the end of each starfish's arm or ray?
7. What is one thing a starfish may eat?
8. Who are two starfish enemies?

Lesson Number: 13
Skills: Creative,
Communicative

DANGEROUS DAN

LESSON CONCEPT

The jellyfish is a unique sea animal with many distinguishing and identifiable characteristics.

COMPETENCY GOALS

1. The learner will recognize the main idea and details.
2. The learner will demonstrate adequate comprehension skills.
3. The learner will enjoy learning activities related to concepts of science.

OBJECTIVES

1. The learner will discover some characteristics of the jellyfish.
2. The learner will become aware that jellyfish can harm them while swimming or playing on the beach.

BACKGROUND INFORMATION

Jellyfish are very colorful and attractive, therefore people tend to pick them up when they find them on the beach. Caution should be taken whenever a jellyfish is near, either in the water or on the beach. The tentacles of the jellyfish sometimes produce a very stinging sensation if they are touched. The jellyfish uses their ability to sting for protection and for catching food.

VOCABULARY

jellyfish
cube
tentacles
victim
oxygen
poison
sea wasp

TEACHER PREPARATION

Read the letter Dangerous Dan writes to your class, supplementary sheets 13.1 and 13.2. Duplicate the puzzle for use an an evaluative instrument, supplementary sheet 13.3.

SOURCES

Selsam, Millicent E. Animals of the Sea. New York: Four Winds Press. 1975.

Shepherd, Elizabeth. Jellyfishes. New York: Lothrop, Lee and Shepard Company. 1969.

Lesson Number: 14
Skills: Creative,
Measurement,
Inquiry

A STING FROM JELLY

LESSON CONCEPT

Jellyfish stings may be dangerous to people swimming in the ocean.

COMPETENCY GOALS

1. The learner will perform safely in recreational pursuits.
2. The learner will select safe places to play.

OBJECTIVES

1. The learner will discover how to avoid being stung by the jellyfish.
2. The learner will find out a home remedy that can be used if they are stung by a jellyfish.

VOCABULARY

venomous tentacles remedy stingers jellyfish disc

BACKGROUND INFORMATION

The jellyfish uses its tentacles to catch fish and other food. It stings the fish and then it is able to catch it.

TEACHER PREPARATION

Make charts or posters of supplementary sheets 14.1 and 14.2. Reproduce supplementary sheets 14.3, 14.4 and 14.5 for student worksheets.

ACTIVITIES

1. POSTERS (Supplementary Sheets 14.1 and 14.2)

Two posters may be made illustrating the prevention of jellyfish stings as well as home remedies for the stings. Enlarge the enclosed posters and display in a center for the children to see and become aware of the information. Discuss with the class the information contained. Read stories and show pictures of jellyfish. Explain how a jellyfish uses its tentacles to stun a fish so that the jellyfish can catch and eat it.

2. WHAT'S HAPPENING (Supplementary Sheet 14.3)

Give each child a copy of "What's Happening?" Ask them to create a story about the picture. Include in the story the name of the animal. What is the animal doing? What is happening to the person in the picture? What should the person do next? In writing the story, the student will demonstrate his/her knowledge of how to treat a jellyfish sting. Have the students color their picture.

VARIATION--Kindergarten level: Have the children dictate a story describing what is happening in the picture. Ask the children to color their pictures.

3. WHO AM I? (Supplementary Sheet 14.4)

Give each student a copy of "Who Am I?" Have them complete the dot-to-dot picture by drawing lines from number to number and answer the questions at the bottom of the page. Ask them to decorate their pictures by adding other sea animals they have learned about.

4. POEM (Supplementary Sheet 14.5)

Give the students each a copy of the poem, JELLYFISH by Diane Forrest. Read the poem to the class. Divide the class into several sections. Have each section read one or two lines. Emphasize rhythm and try to keep the poem flowing evenly.

VARIATION--Kindergarten level: Read the poem to the class. Make a chart of the poem and have the children draw and color a jellyfish cut-out to glue onto the poster. Display on a hall bulletin board or in a science center.

SOURCES

Selsam, Millicent E. Animals of the Sea. New York: Four Winds Press. 1975.

Shepherd, Elizabeth. Jellyfishes. New York: Lothrop, Lee and Shepard Company. 1969.

Lesson Number: 15
Skills: Manipulative,
Creative

A JELLYFISH THAT DOESN'T STING

LESSON CONCEPT

The jellyfish has many tentacles with which to sting and catch food.

COMPETENCY GOALS

1. The learner will develop creative skills.
2. The learner will develop manual skills.
3. The learner will understand the basic characteristics of animals.

OBJECTIVES

1. The learner will become familiar with basic anatomy of a jellyfish.
2. The learner will be informed how the jellyfish uses its tentacles for protection and getting food.

MATERIALS

- pattern and directions (included)
- embroidery floss
- scissors
- yarn scraps
- thread
- material

TEACHER PREPARATION

Reproduce supplementary sheets 15.1 and 15.2. Obtain scraps of yarn, thread, material and embroidery floss to be used as tentacles.

STUDENT PREPARATION

Bring to school any scraps of yarn, thread, embroidery floss and material.

ACTIVITIES

1. LET'S MAKE A JELLYFISH!

   Have the students make jellyfish models by following the directions on Supplementary Sheet 15.1.

2. HOW AND WHY

   a. Involve the class in a discussion of how the jellyfish paralyzes its prey. The tentacles located around the bell margin contain stinging cells. If a jellyfish is touched or it senses another organism nearby, the stinging cells will discharge stingers that paralyze tiny organisms.

   b. Discuss how a jellyfish feeds. Long oral arms that hang down from the center of the underside of the body convey animals such as small fish to the mouth. Tiny microscopic floating organisms called plankton become entrapped in mucus on the underside of the jellyfish as it sinks downward. Tiny hairs called cilia sweep the plankton to the bell margin where it is scraped off by the oral arms. Cilia in groves on the oral arms sweep the food to the mouth.

3. IT'S A JELLYFISH! (Supplementary Sheets 15.2 and 15.3)

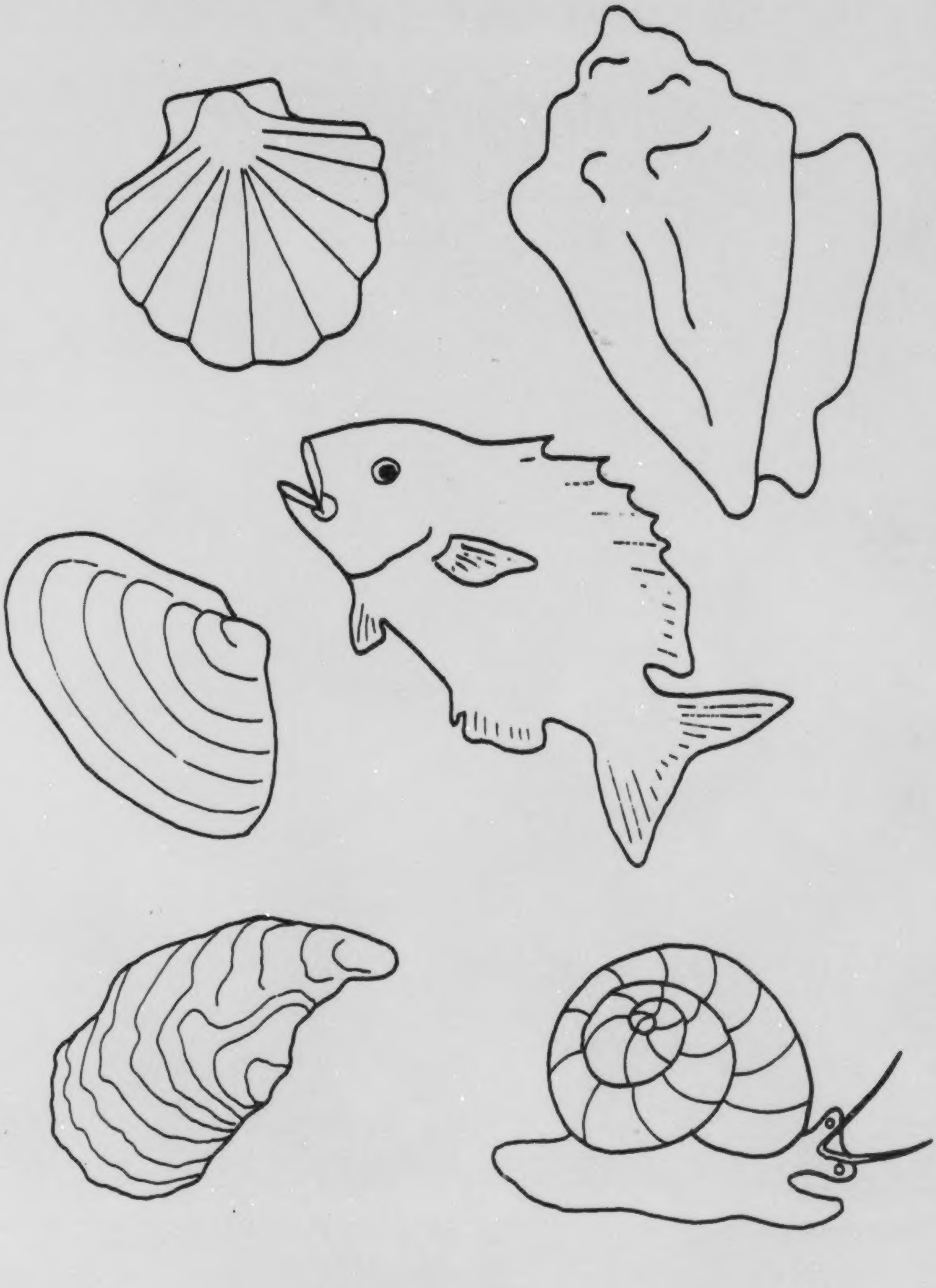
   Use the jellyfish crossword puzzle as an evaluation of the children's knowledge for this lesson. Correct answers are given on supplementary sheet 15.3.

Coastal Awareness in Public Education
PROJECT
Cape

Copyright © 1982
Dare County Board of Education
Manteo, North Carolina

K-2b
1.1

IS THIS A MOLLUSK HOME ?

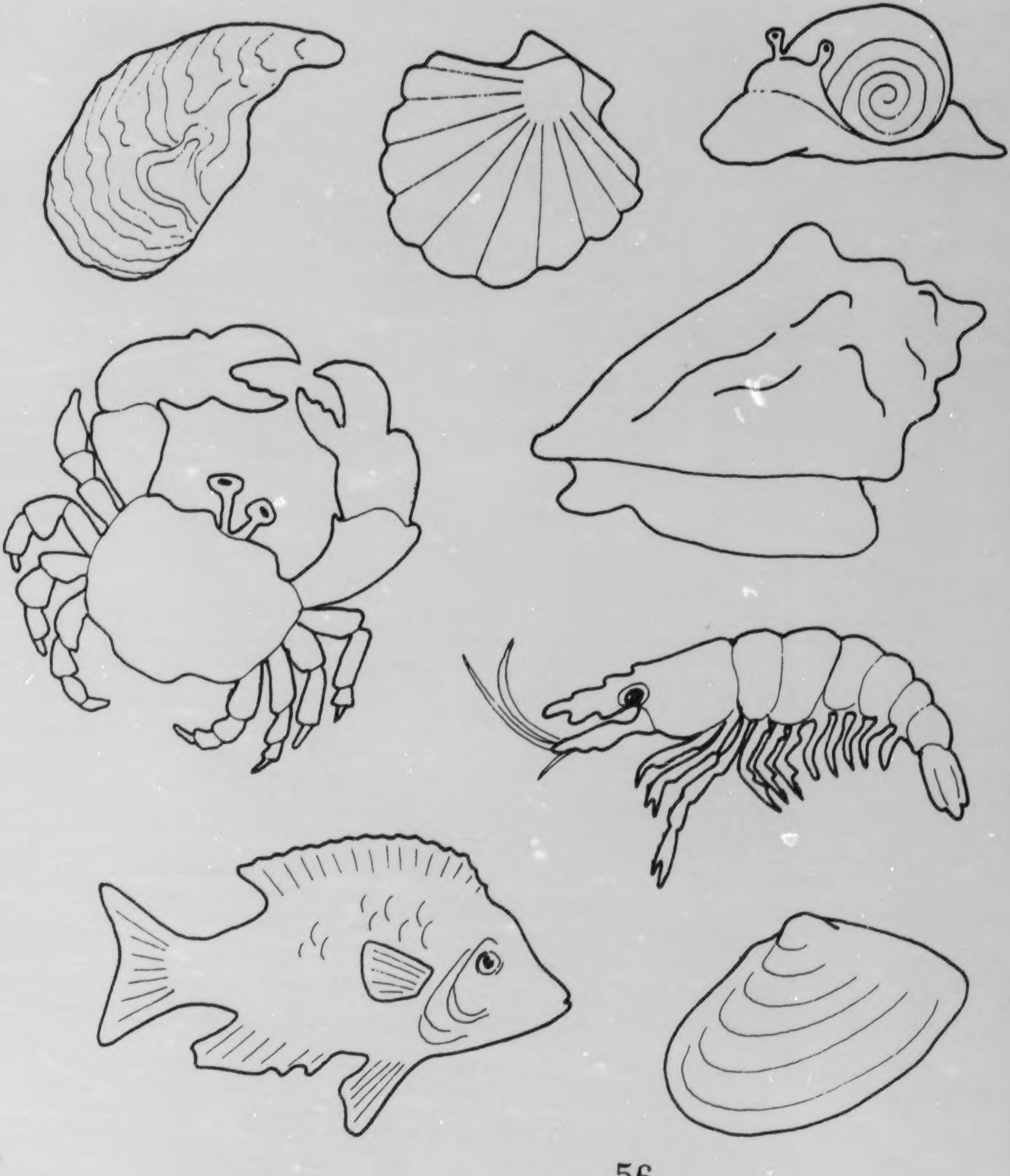


K-2b
1.2

LET'S GO SHELLING

LET'S GO SHELLING

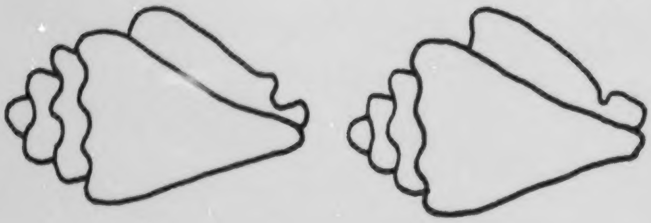
K-2b
1.3



K-2b
1.4

MATCH ME !

Draw a line from the picture to the correct number.



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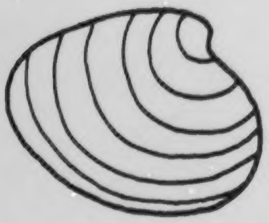

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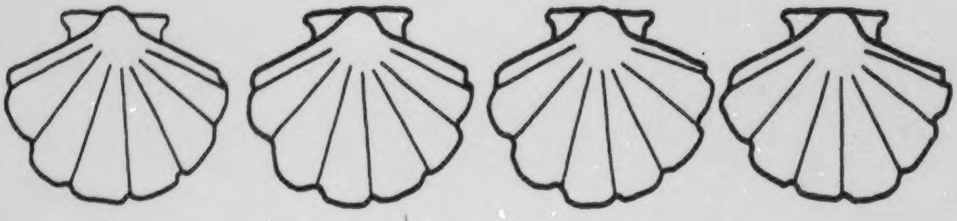

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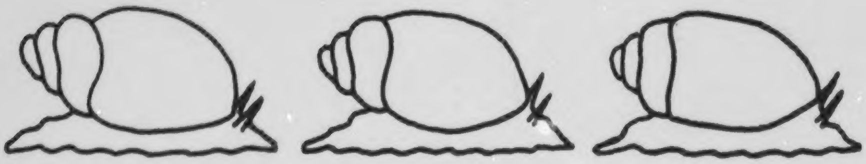

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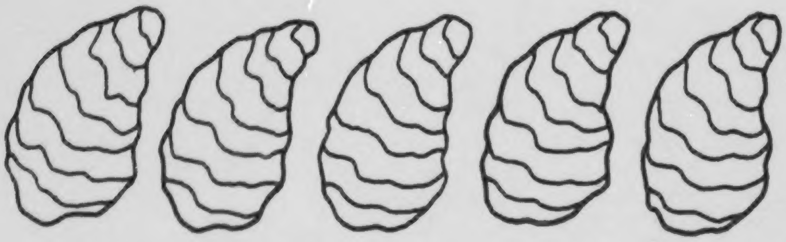


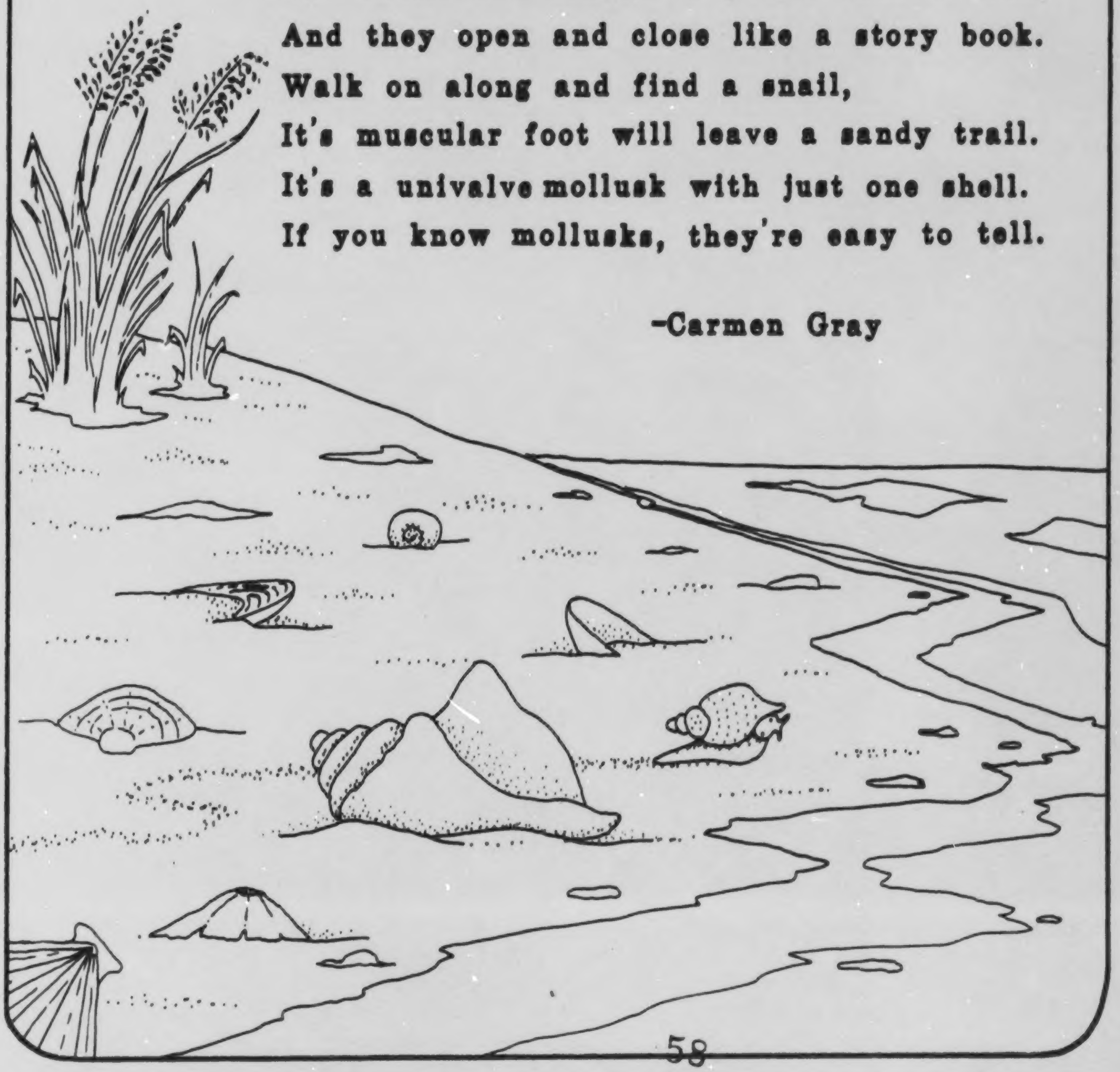
1

K-2b
1.5

MOLLUSKS

If you take a little walk along the beach,
You'll find that mollusks are within your reach.
Pick up a clam and look at it well.
It's a bivalve mollusk with a double shell.
The shells are hinged if you'll take a look,
And they open and close like a story book.
Walk on along and find a snail,
It's muscular foot will leave a sandy trail.
It's a univalve mollusk with just one shell.
If you know mollusks, they're easy to tell.

-Carmen Gray



MY FAVORITE MOLLUSK

K-2b
2.1

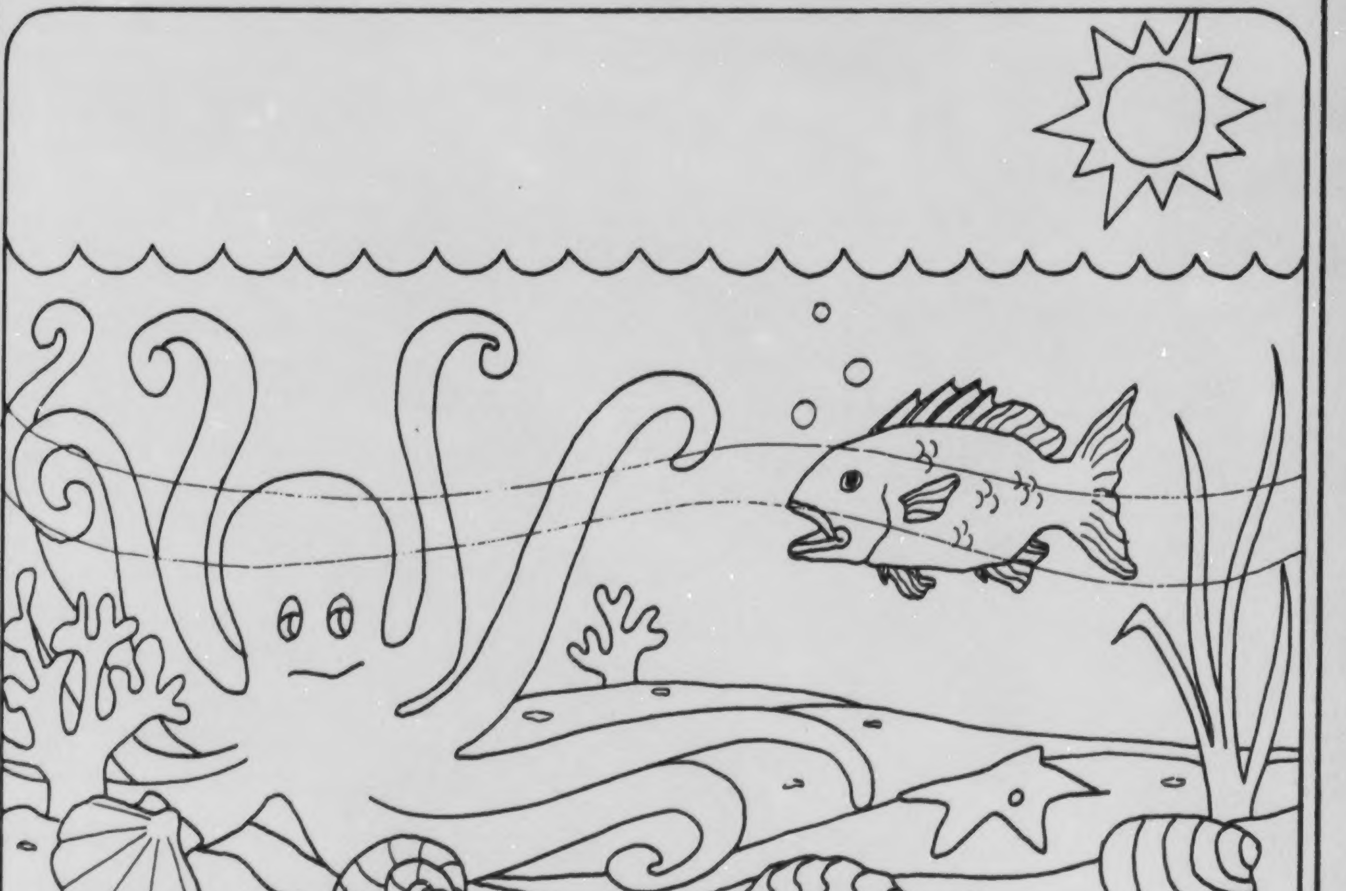
Mural, mural on the wall...who do I like best of all?

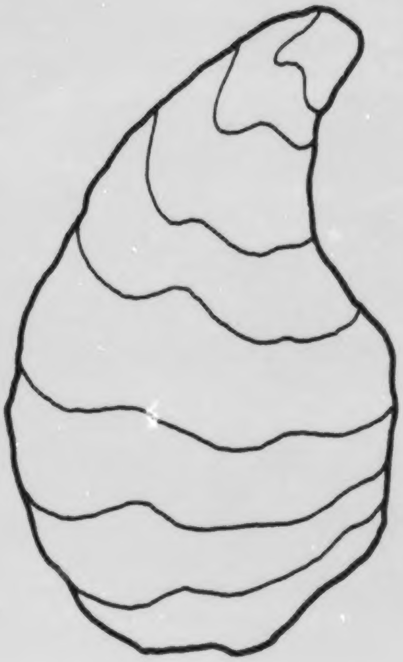
AN ENEMY LURKS

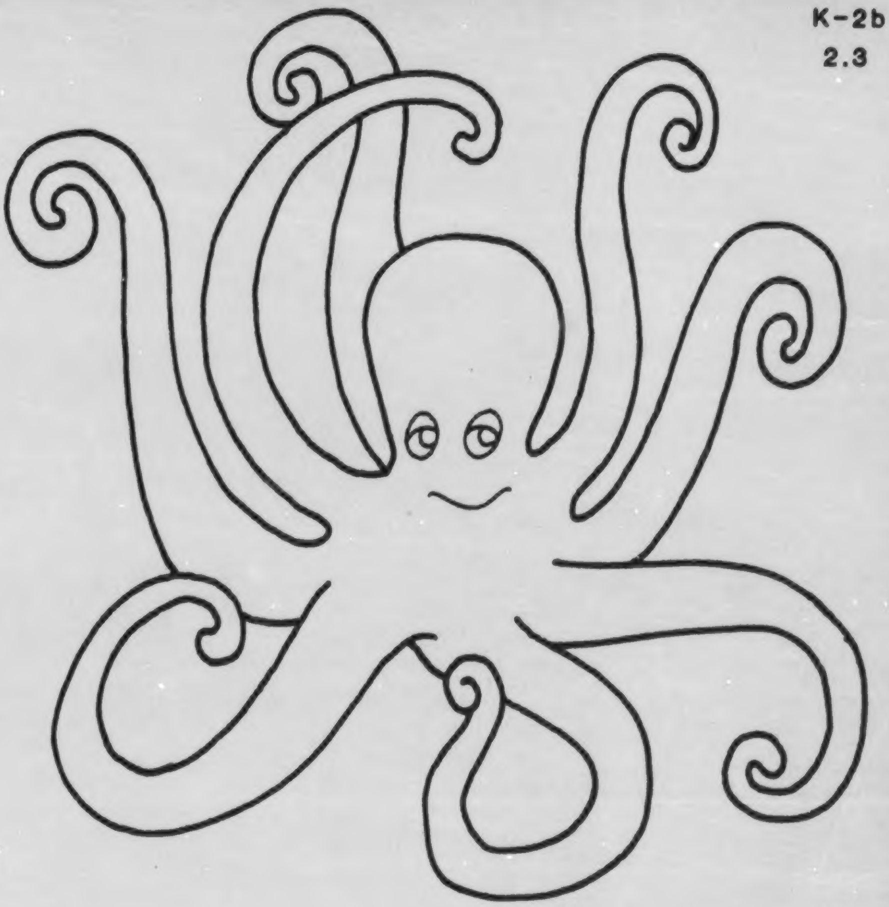
K-2b
2.2

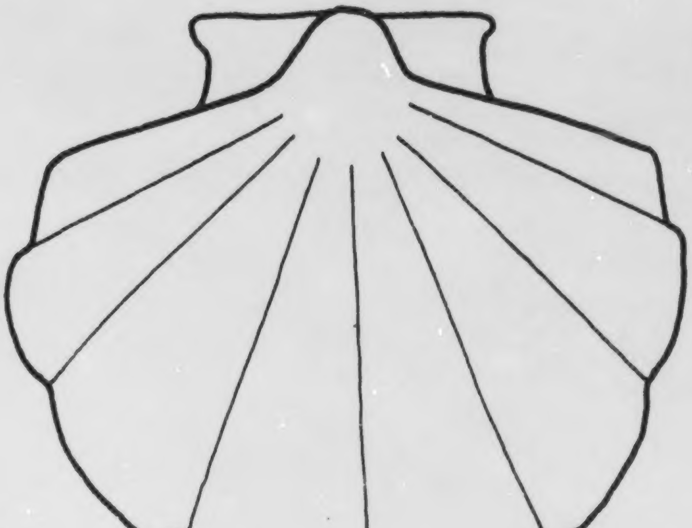
Friends

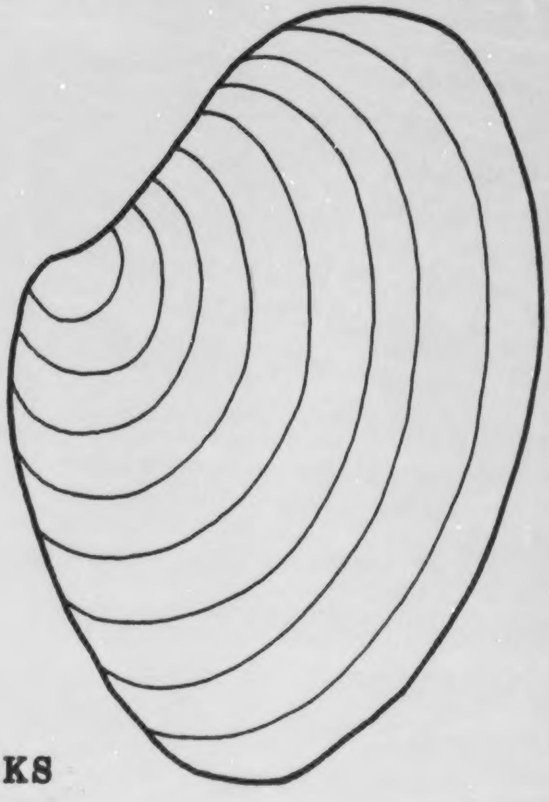
Enemies





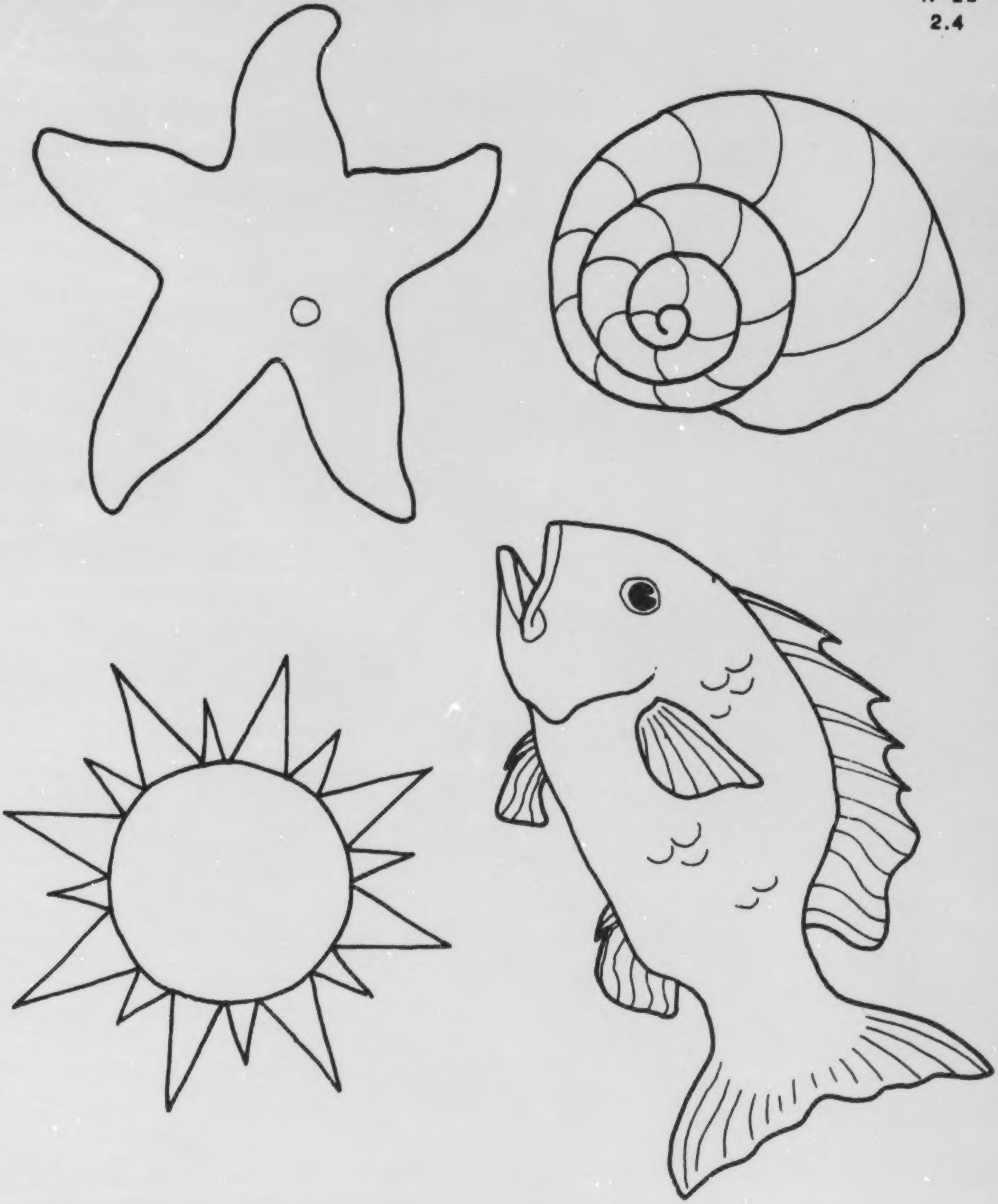






Playing pieces for AN ENEMY LURKS

K-2b
2.4



Playing pieces for AN ENEMY LURKS

K-2b
2.5

MATCH ME !

Draw a line to the correct picture.

1. I dry out a mollusk's body with my rays.

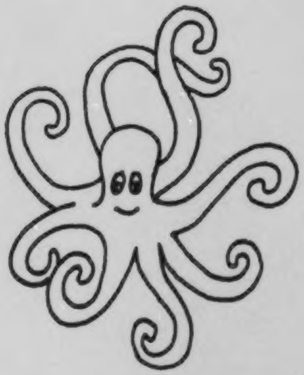
2. I try to pull the oyster shell apart with my arms.

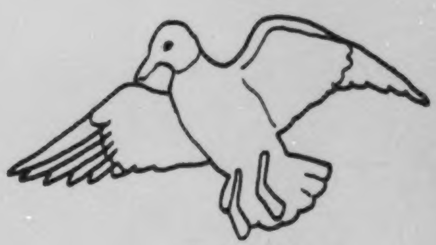
3. I attack oysters, clams and scallops.

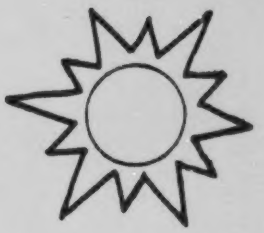
4. I eat snails and clams by wrapping my tentacles around them to open their shells.

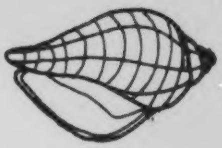
5. I use my strong bill to eat mollusks.

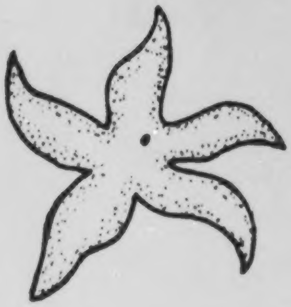
6. I drill right through the oyster's shell and suck out its body.

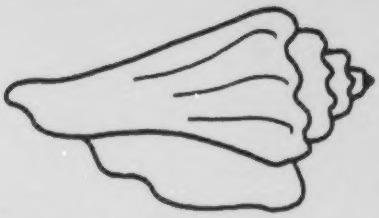






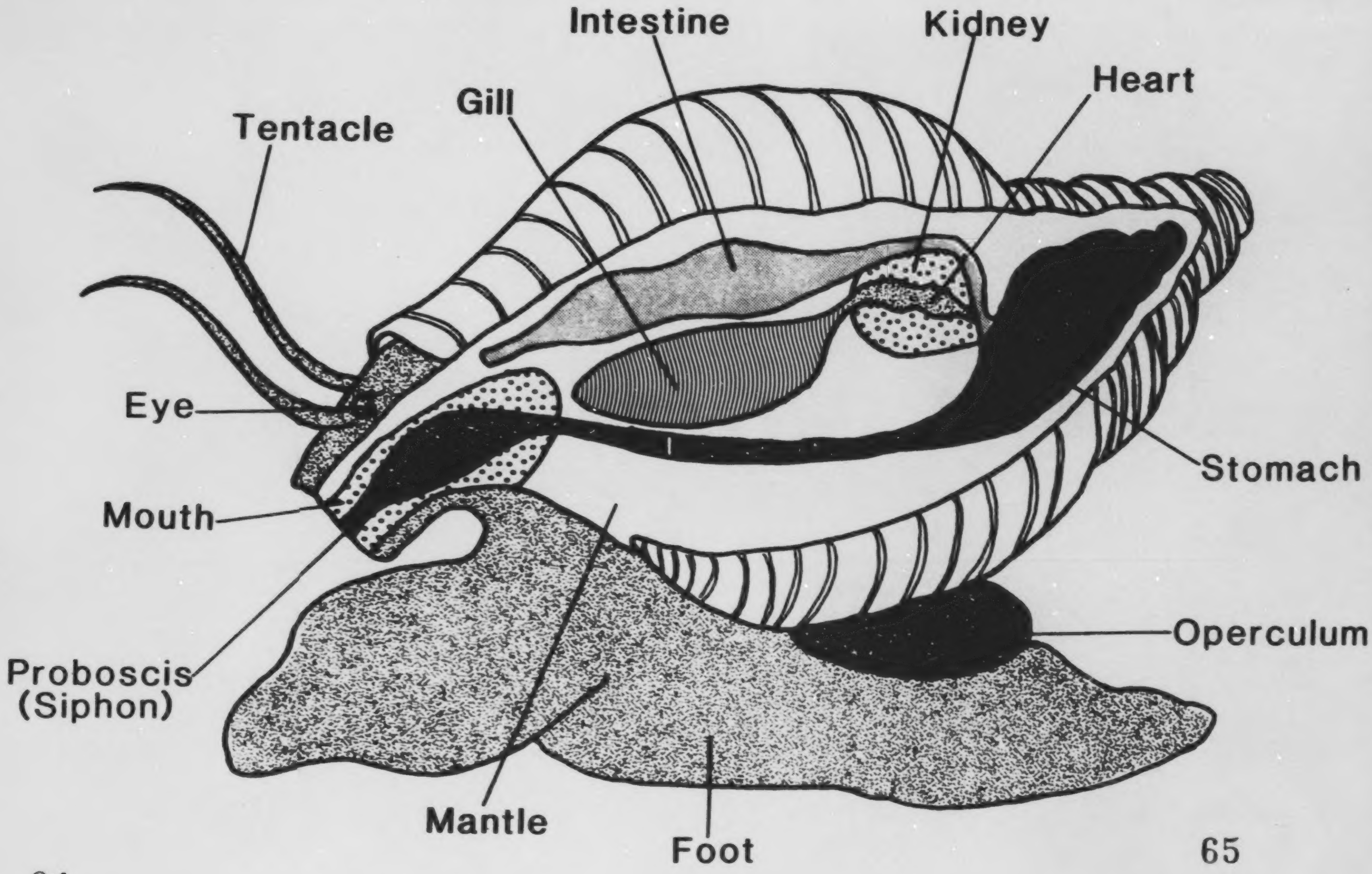






K-2b
3.1

PARTS OF A UNIVALVE MOLLUSK


Intestine
Kidney
Heart
Gill
Tentacle
Eye
Stomach
Mouth
Operculum
Proboscis (Siphon)
Mantle
Foot

K-2b
3.2

FIND THE HIDDEN WORDS

H	E	M	S	Y	C	L	A	M	J	B	V
W	U	O	Y	S	T	E	R	T	E	E	O
S	A	W	E	T	U	T	Y	N	L	N	X
T	M	K	L	R	B	E	A	C	H	C	H
A	W	U	D	A	R	E	H	A	L	S	T
R	Z	A	S	T	H	R	O	P	O	E	O
F	D	R	B	S	O	Y	C	A	S	A	E
I	O	C	A	Z	E	I	E	L	H	S	X
S	A	H	I	S	T	L	A	S	A	H	C
H	N	A	C	T	I	F	N	C	T	O	A
N	D	E	O	Z	L	A	S	P	C	R	Y
W	T	O	N	L	I	O	E	N	O	E	O
H	N	L	C	L	A	N	C	E	T	N	T
E	P	O	H	S	H	E	S	H	E	L	L
L	D	G	N	U	N	S	C	X	A	R	O
K	G	Y	L	D	I	O	V	C	S	P	H
P	R	S	E	A	W	E	E	D	I	C	T

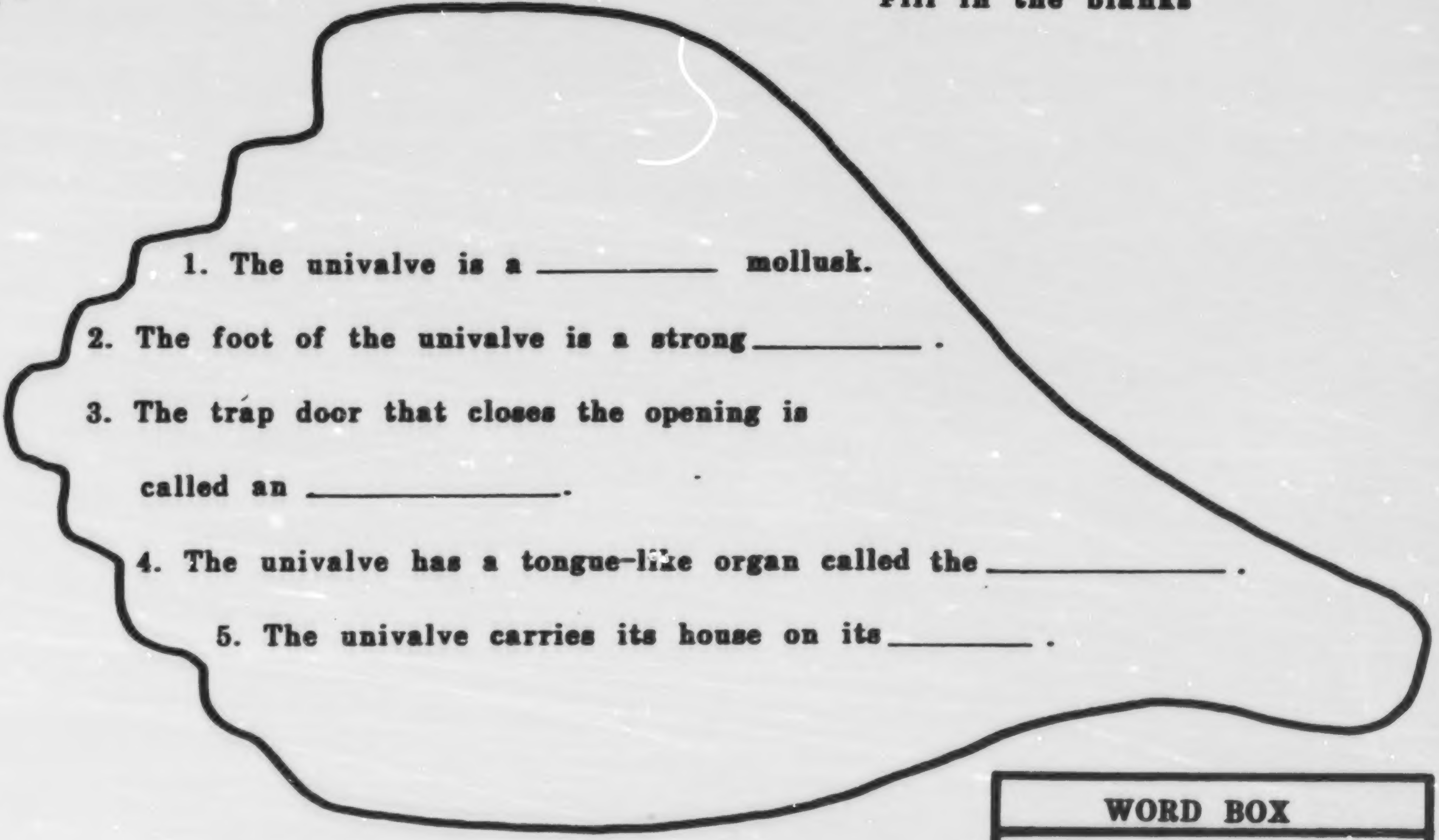
WORD LIST

- SEAWEED
- SHELL
- CONCH
- STARFISH
- MUSSEL
- OCEAN
- CLAM
- SEASHORE
- BEACH
- OYSTER
- SNAIL
- WHELK

K-2b
3.3

ONLY ONE SHELL

Fill in the blanks



1. The univalve is a __________ mollusk.

2. The foot of the univalve is a strong __________ .

3. The trap door that closes the opening is called an __________.

4. The univalve has a tongue-like organ called the __________ .

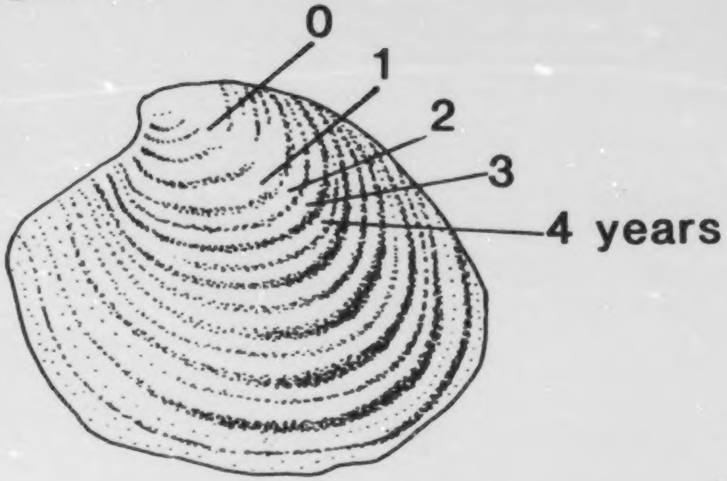
5. The univalve carries its house on its __________ .

WORD BOX

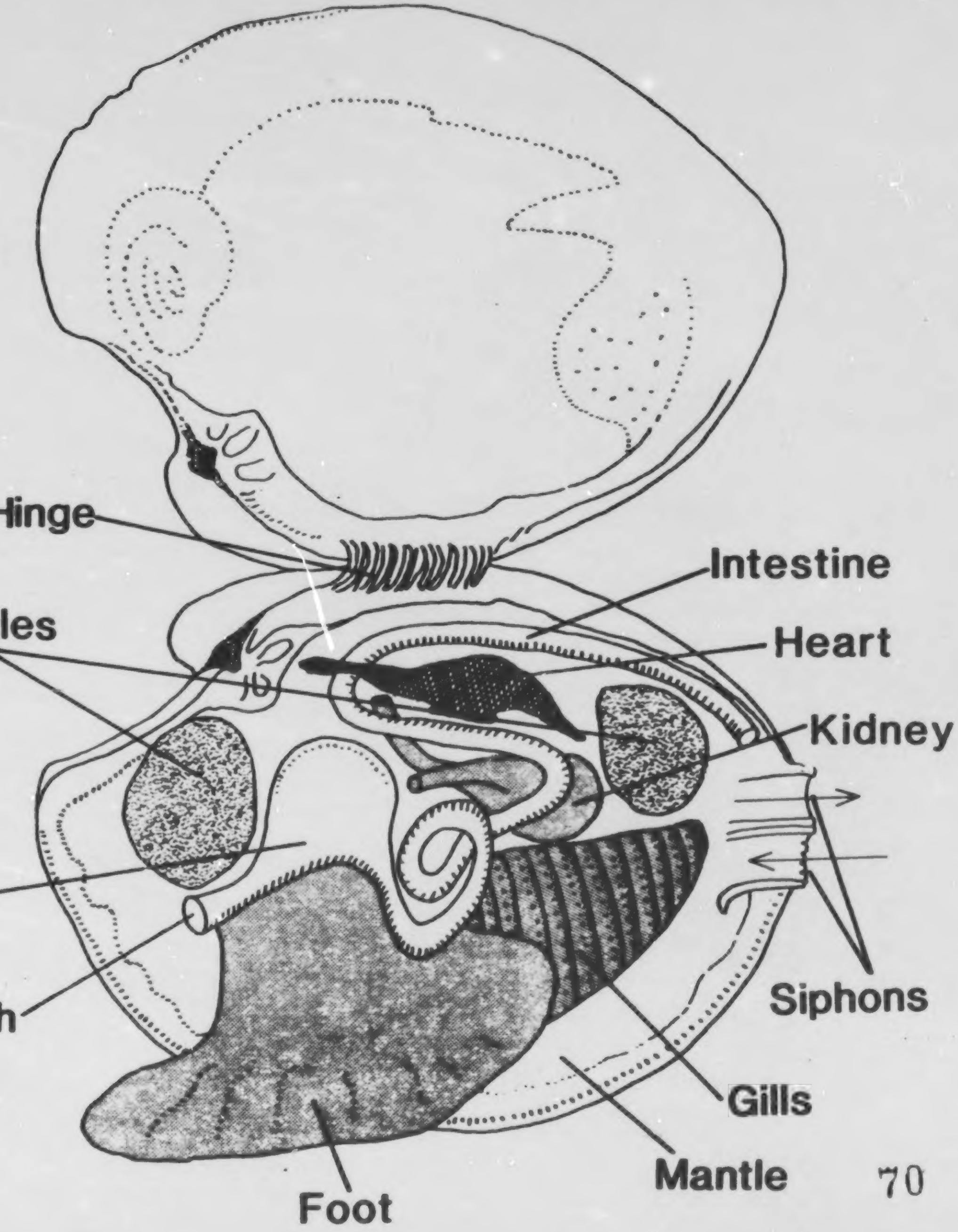
operculum one-shelled

muscle back radula

K-2b
4.1


0
1
2
3
4 years

PARTS OF A BIVALVE MOLLUSK


Hinge
Intestine
Muscles
Heart
Kidney
Stomach
Mouth
Siphons
Gills
Foot
Mantle

LET'S GO FOR A BEACH STROLL!

DIRECTIONS

1. Cut out the playing pieces and glue them to pennies as playing tokens.

2. Two, three or four students may play.

3. Roll the die to determine the order of the players.

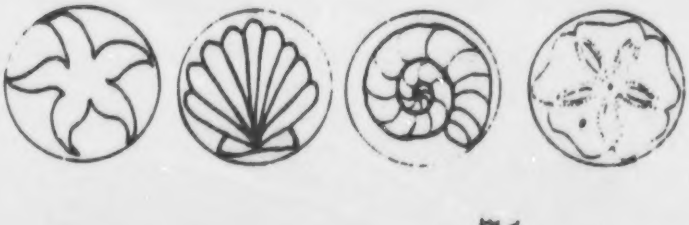
4. Players move the number of spaces shown on the die.

5. As a player lands on a sea animal space, he/she must identify the sea animal. If the player is unable to identify the sea animal, he/she must go back to the START.

6. Players must also follow the directions found on spaces without sea animals.

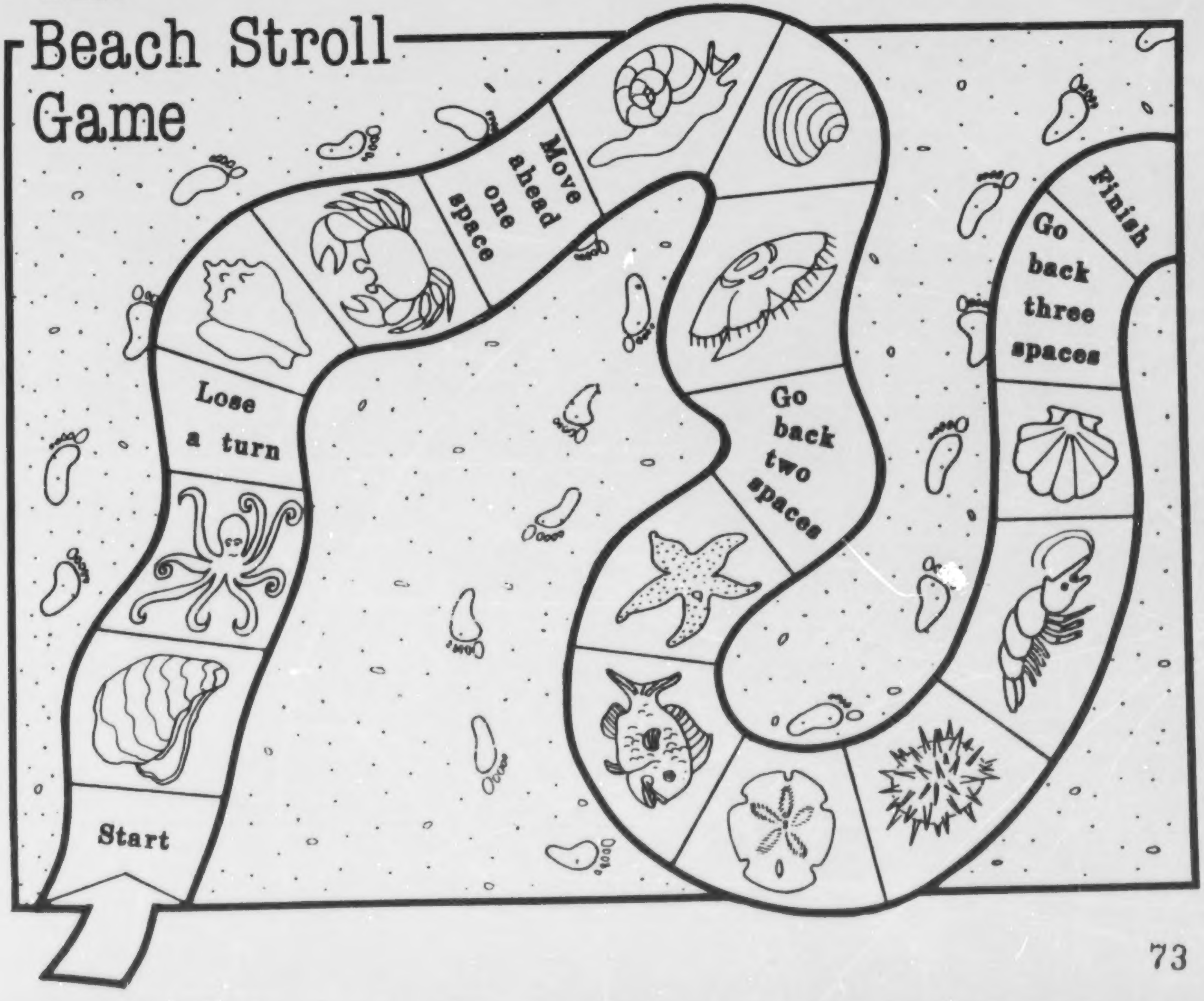
7. The first player to reach "FINISH" wins the game.

Tokens for the Beach Stroll Game



K-2b
4.3

The Beach Stroll Game


Start
Lose a turn
Move ahead one space
Go back two spaces
Go back three spaces
Finish

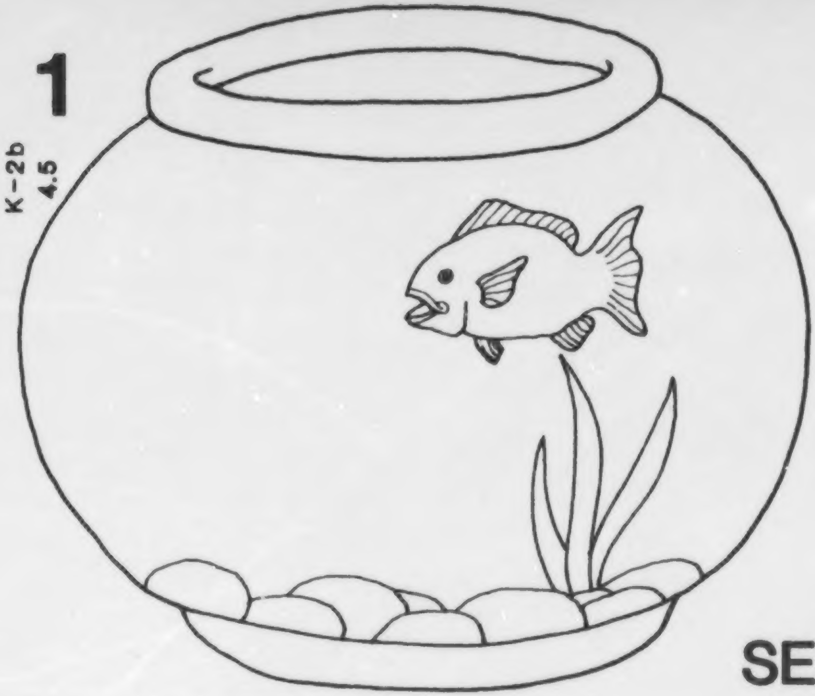
SEASHORE SYLLABLES

RULES

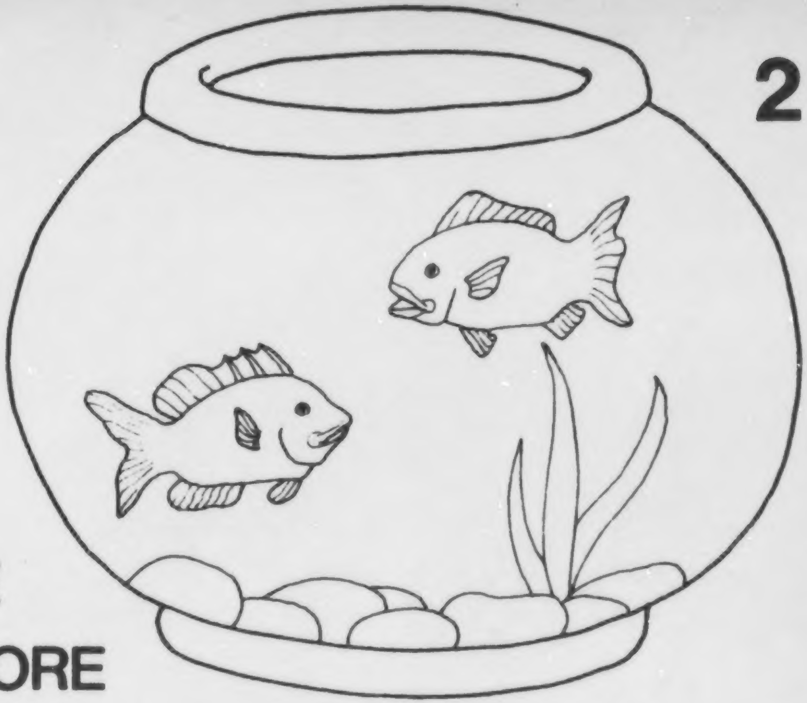
1. Play this game alone, with a friend or with an adult.
2. Place the 4 fish bowls in front of you. Pick up a shell. Decide how many word parts or syllables each word contains.
3. Place the shell in the fish bowl with the number of fish that matches the amount of syllables the word contains.

1

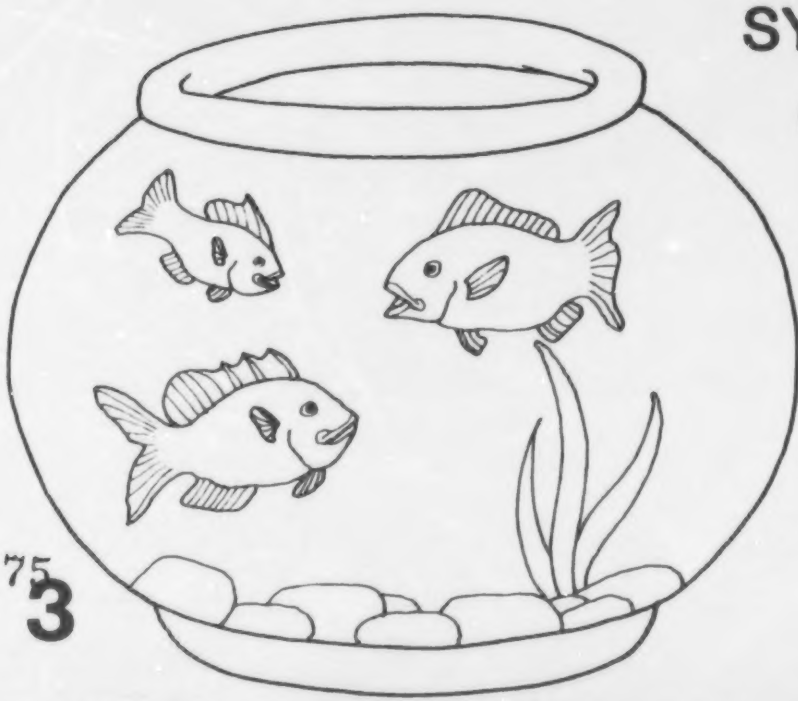
K-2b
4.5



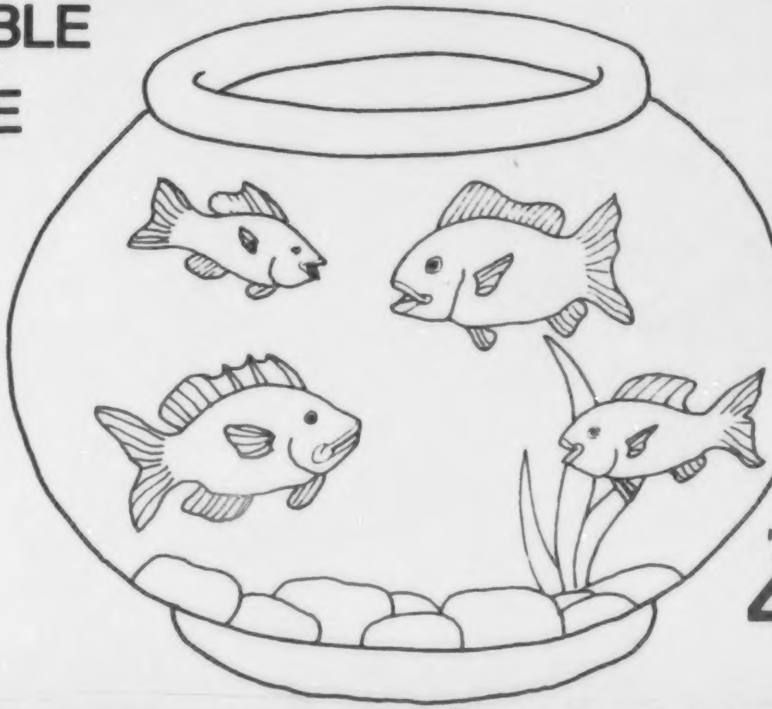
2



THE SEASHORE SYLLABLE GAME

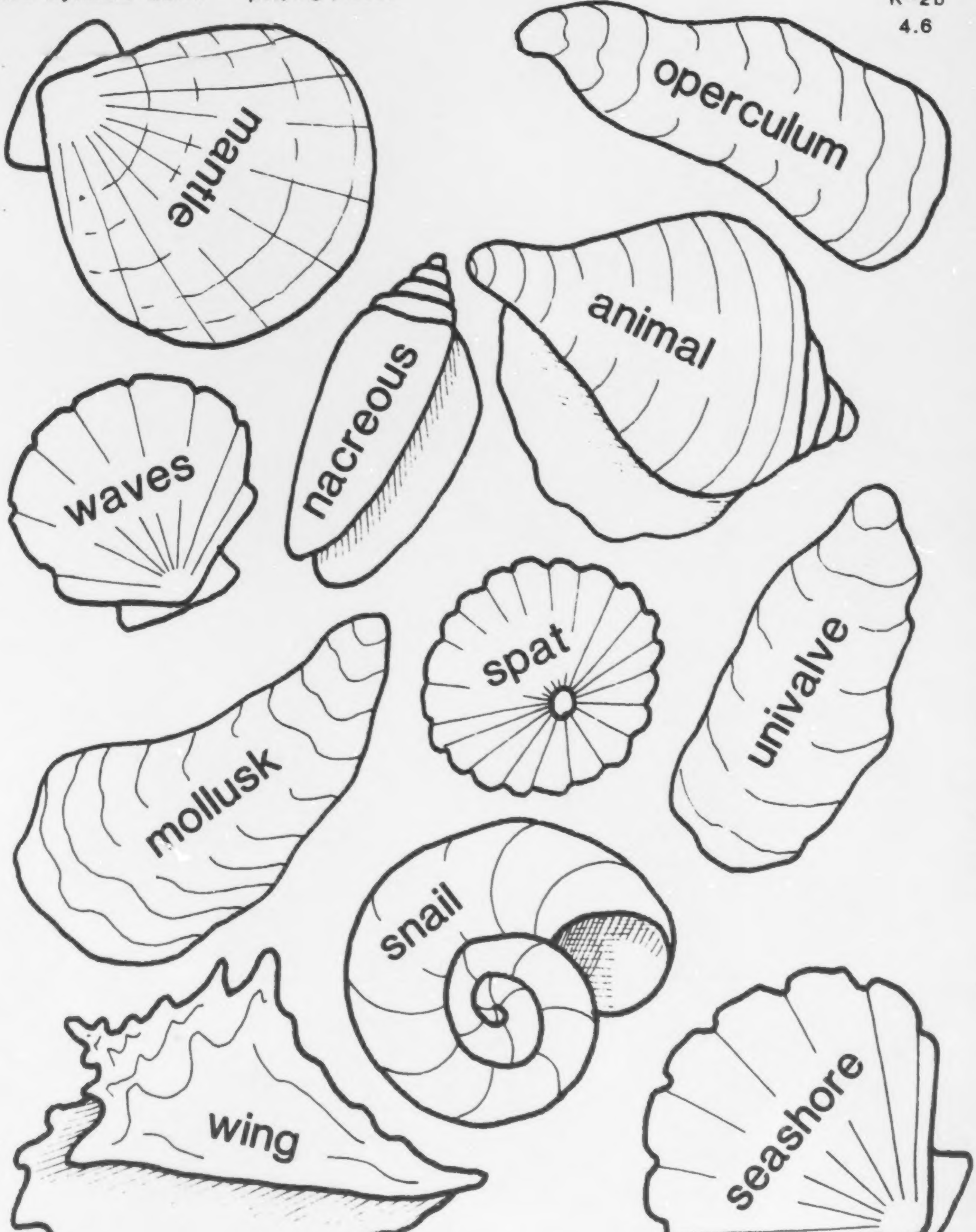


3



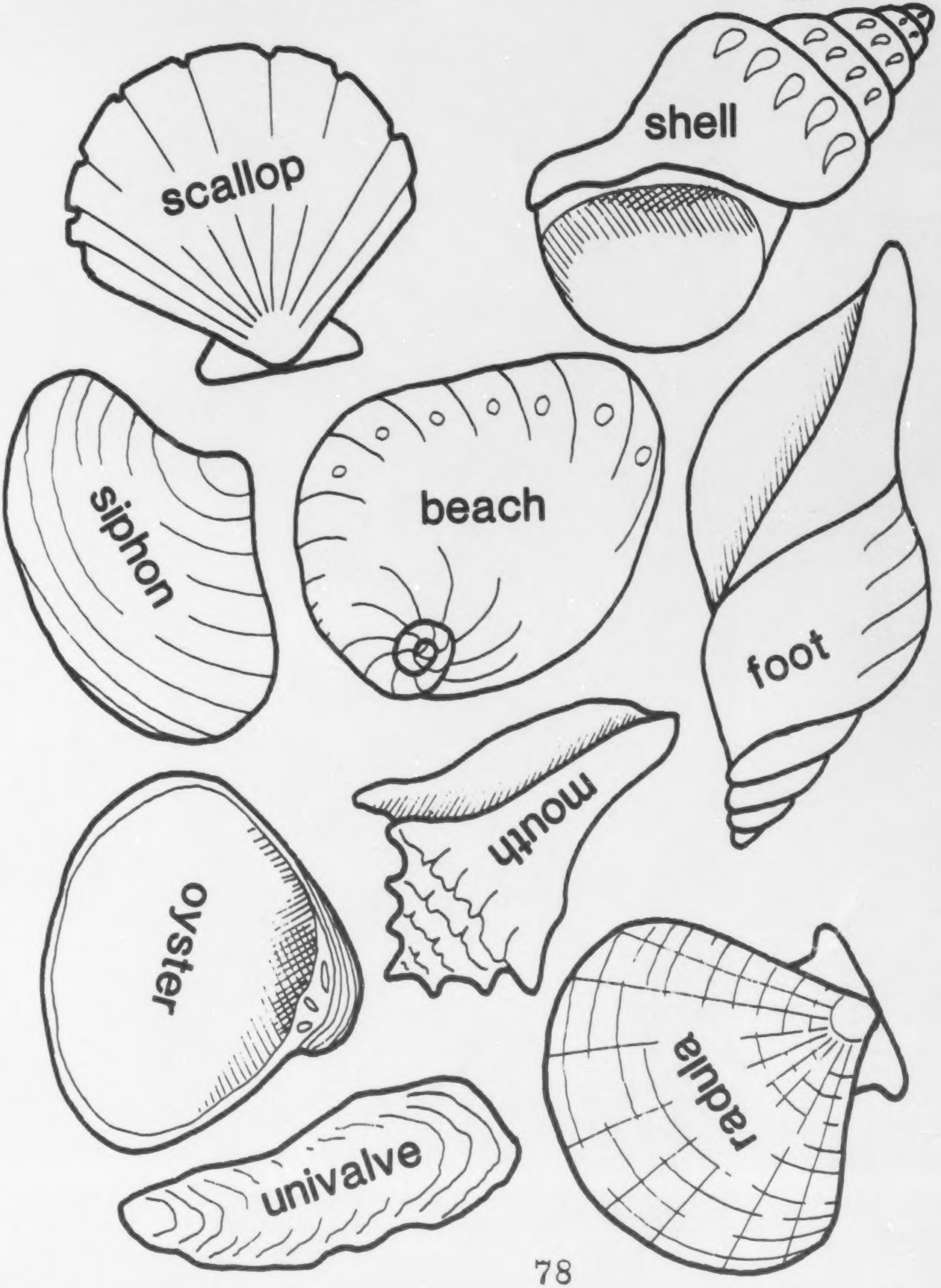
4

Seashore Syllable Game -playing pieces


mantle
operculum
animal
nacreous
waves
spat
univalve
mollusk
snail
wing
seashore

Seashore Syllable Game - playing pieces

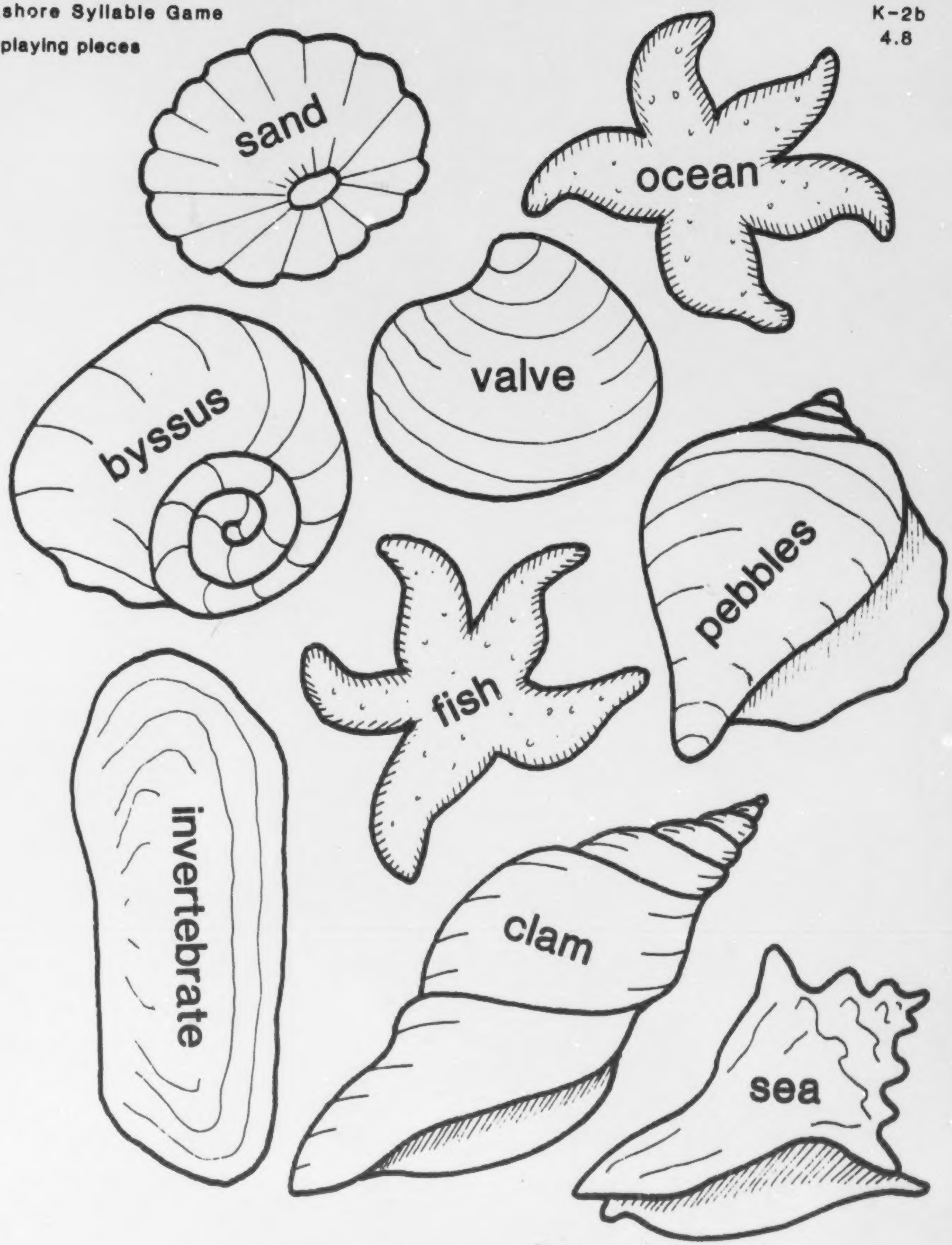
K-2b
4.7


scallop
shell
siphon
beach
foot
mouth
oyster
radula
univalve

Seashore Syllable Game

-playing pieces

K-2b
4.8

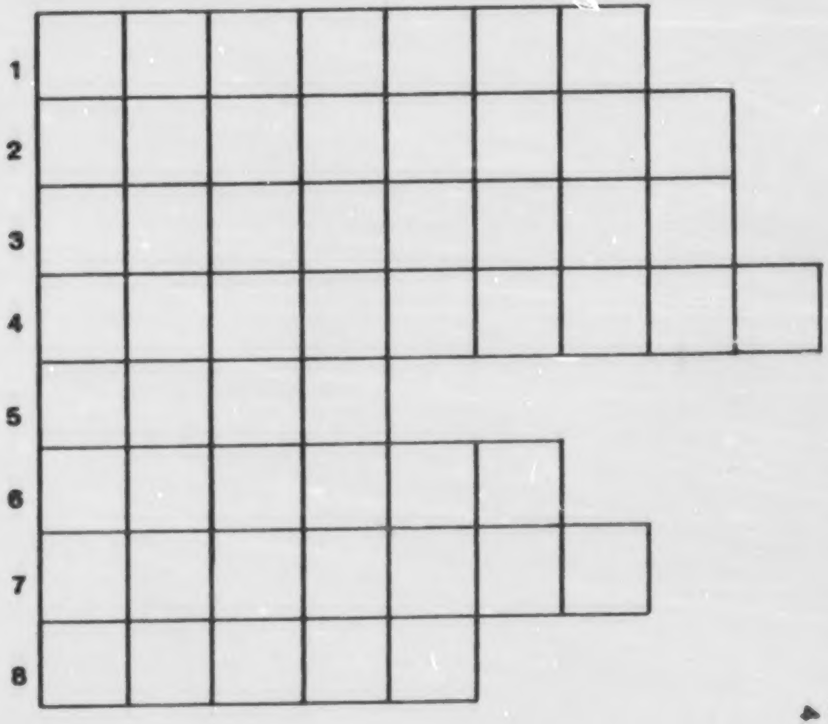

sand
ocean
valve
byssus
pebbles
fish
invertebrate
clam
sea

MOLLUSK PUZZLE

VOCABULARY

mantle
foot
adductor
mollusk
bivalves
siphons
univalves
house

1. The word ______________ means soft.
2. ______________ have two shells.
3. A muscle called the ______________ opens and closes the two shells.
4. ______________ have shells made in one piece.
5. Each mollusk has a ______________.
6. Each mollusk has a ______________.
7. ______________ are found in all mollusks.
8. A mollusk carries its ______________ at all times.



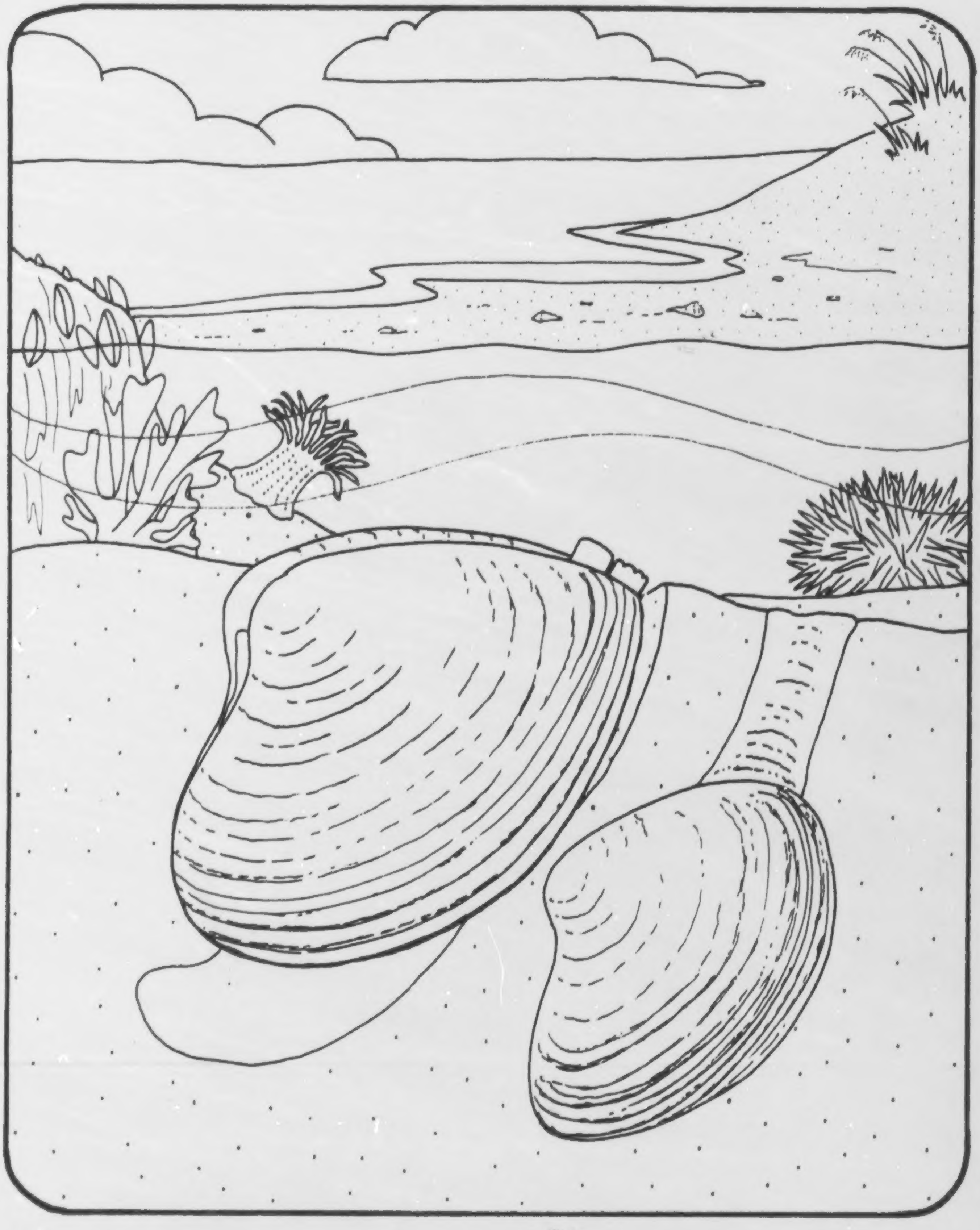
K-2b
4.9

DIRECTIONS

Use the vocabulary words at the top to fill in the blanks in the puzzle and the sentences. The word you choose must fit the same number sentence and puzzle.

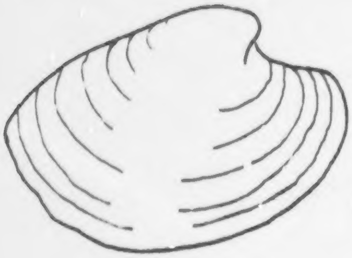
K-2b
5.1

I am a bivalve mollusk. I am a ________________.



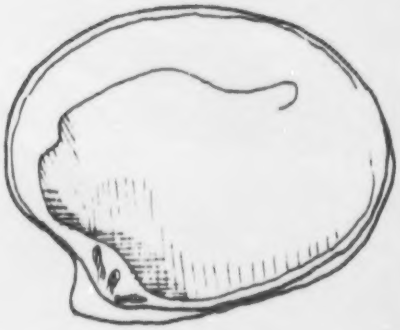
CLAM PUZZLE

K-2b
5.2

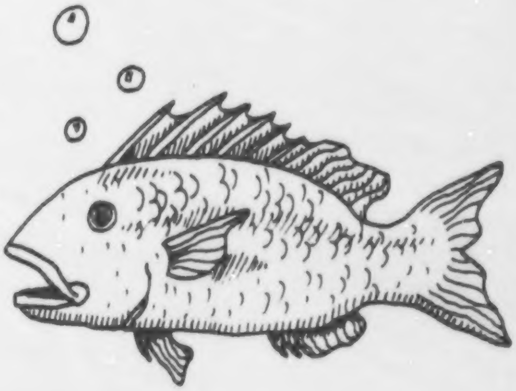


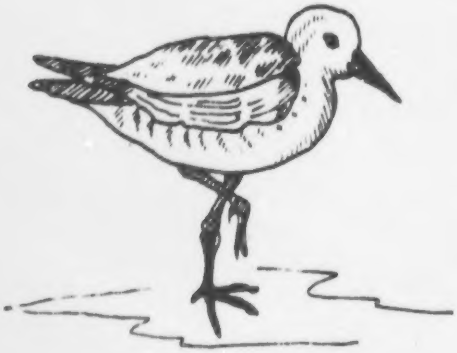
VOCABULARY

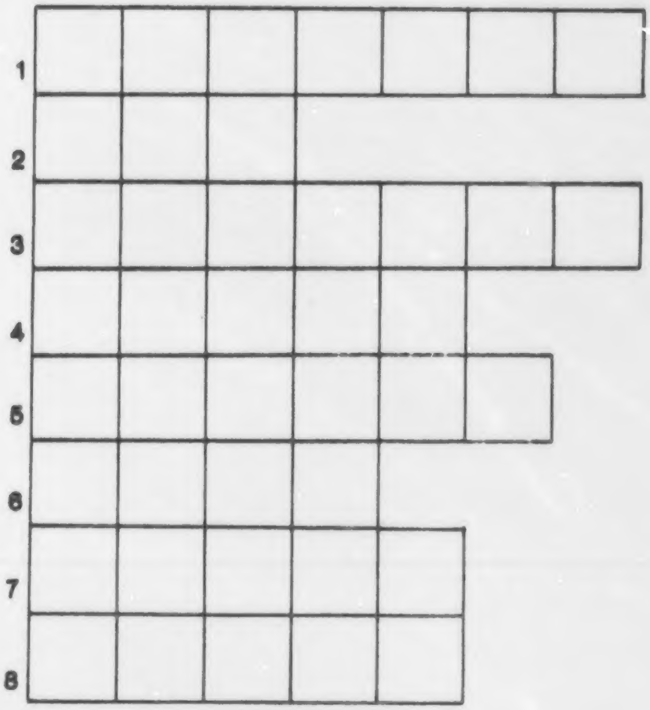
mollusk	hinge
bivalve	gills
two	swim
spines	clams



1. A clam is a ______________________ animal.
2. A clam has ______________ shells.
3. A clam is a ______________________ .
4. Clam shells are joined at a ______________________.
5. Clams have no ____________________ .
6. Clams can ______________________
7. A clam has ________________ for breathing.
8. Fishes and birds eat ______________________ .







DIRECTIONS

Use the vocabulary words at the top to fill in blanks in the puzzle and the sentences. The word you choose must fit the same number puzzle and sentence.

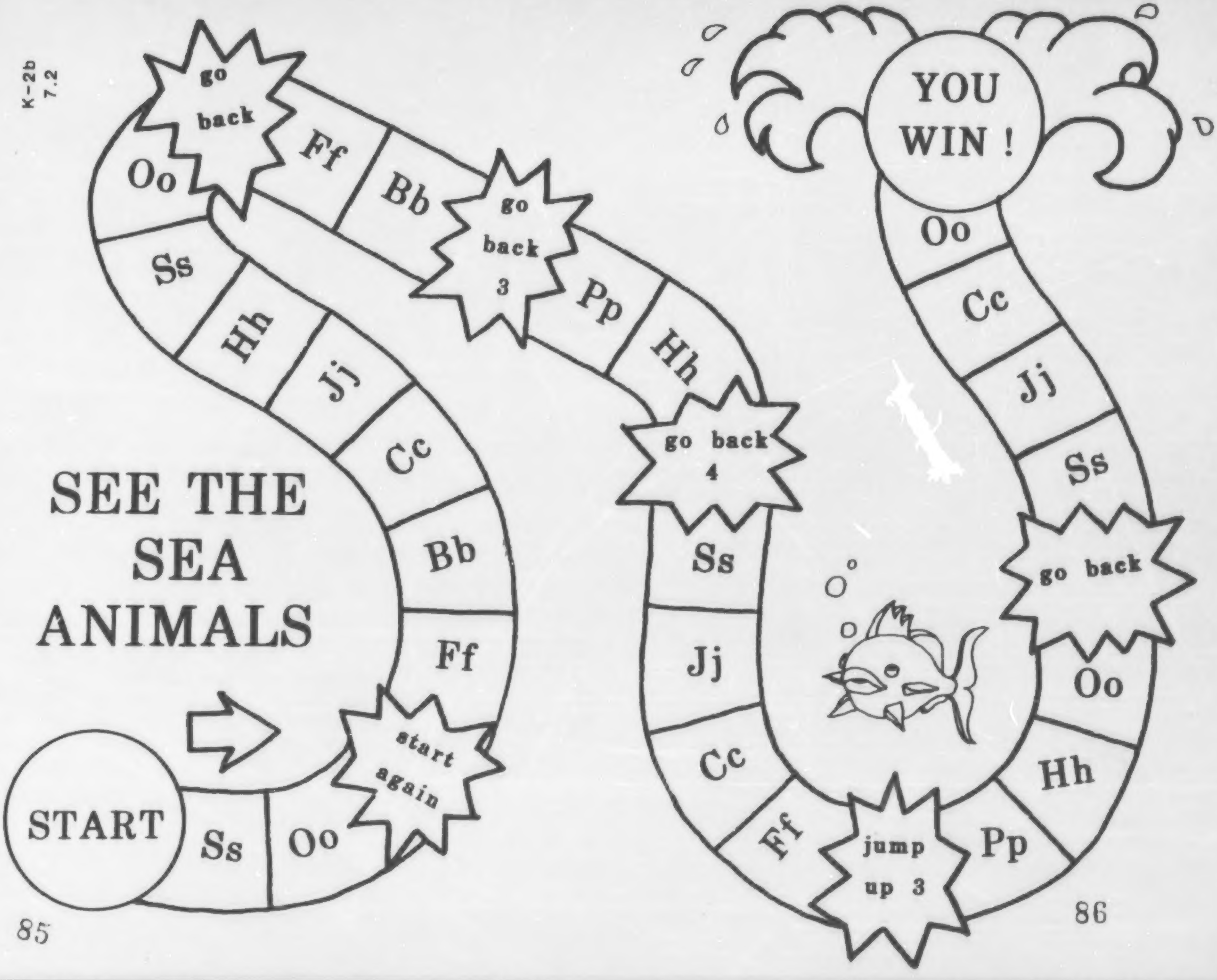
SEE THE SEA ANIMALS

DIRECTIONS

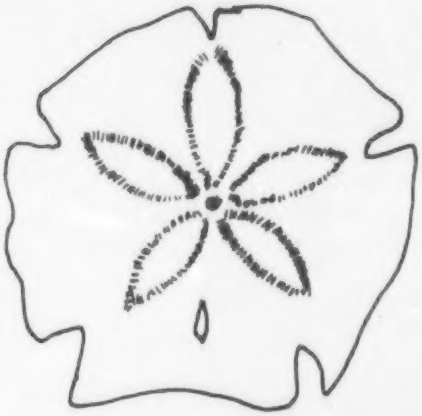
1. Two, three or four students may play.
2. Use small shells, pennies or paper cut-outs as tokens.
3. Place all cards with the illustrations of the animals face up.
4. Determine the order of the players alphabetically using first names.
5. Players choose one card and identify the animal. If the answer is correct, move the token forward to the space with the appropriate first letter consonate.
6. The first player to reach the end of the game wins.

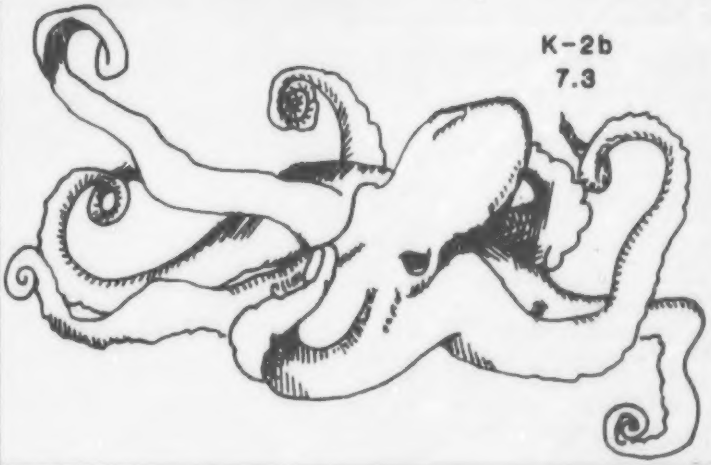
K–2b
7.2

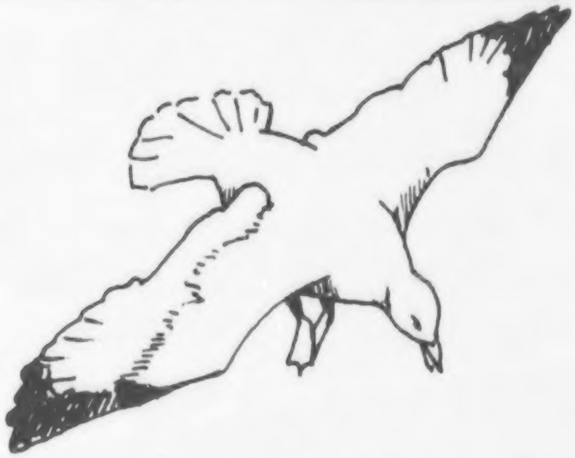
SEE THE SEA ANIMALS

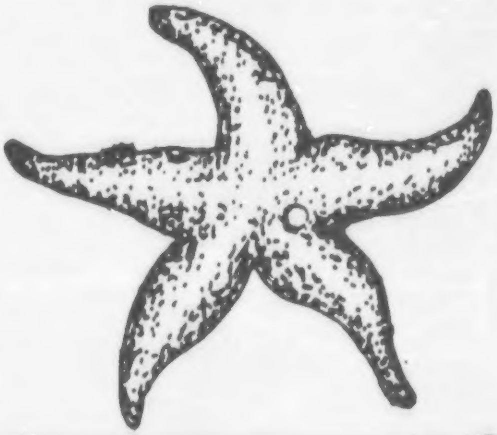

START
Ss
Oo
start again
Ff
Bb
Cc
Jj
Hh
Ss
Oo
go back
Ff
Bb
go back 3
Pp
Hh
go back 4
Ss
Jj
Cc
Ff
jump up 3
Pp
Hh
Oo
go back
Ss
Jj
Cc
Oo
YOU WIN !

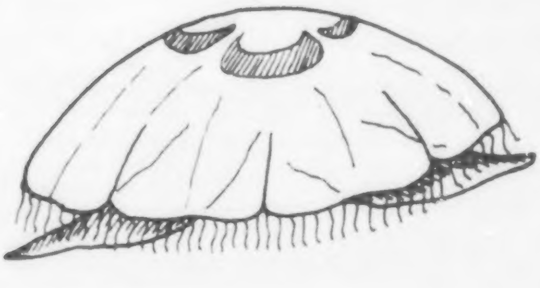
K-2b
7.3

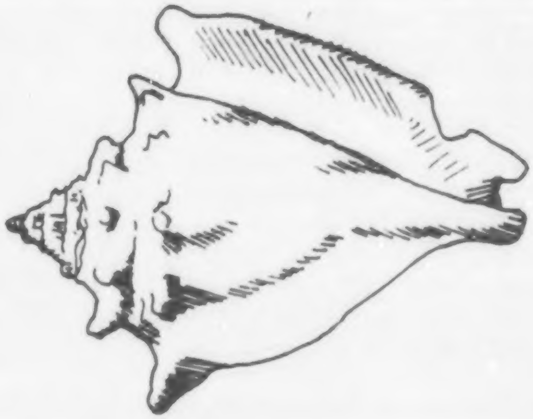


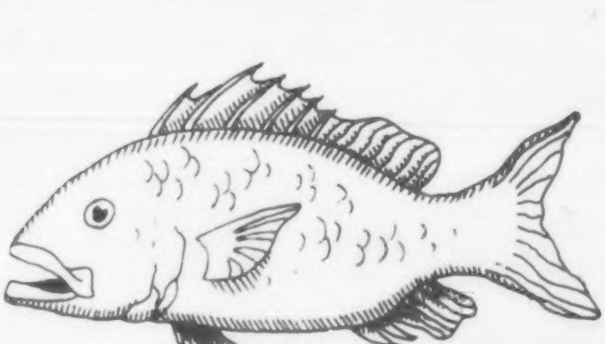


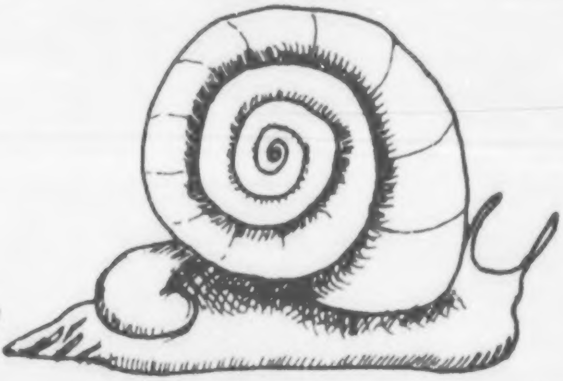












OCTOPUS

SAND DOLLAR

STAR FISH

GULL

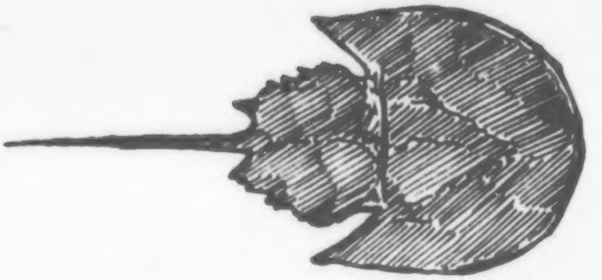
CONCH

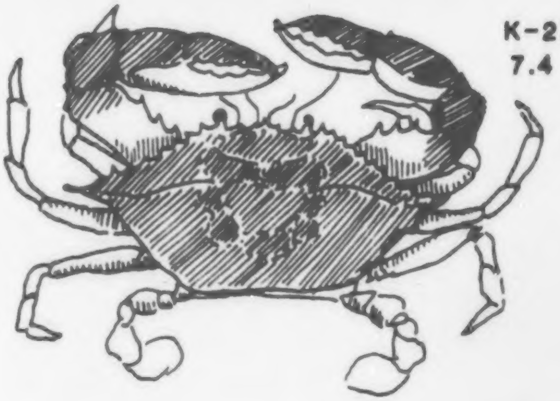
JELLYFISH

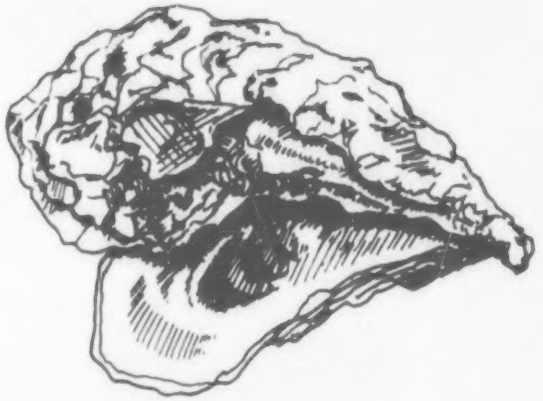
SNAIL

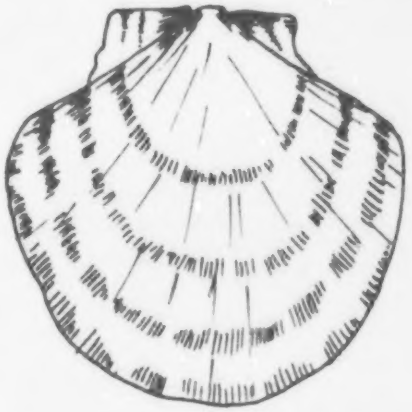
FISH

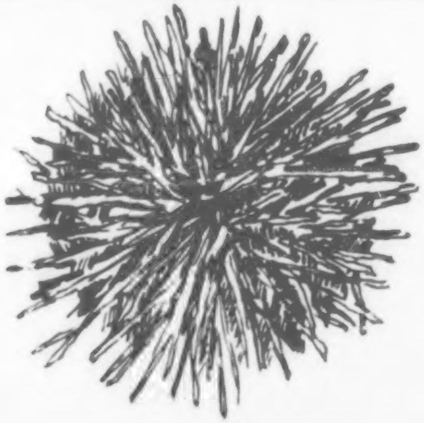
K-2b
7.4

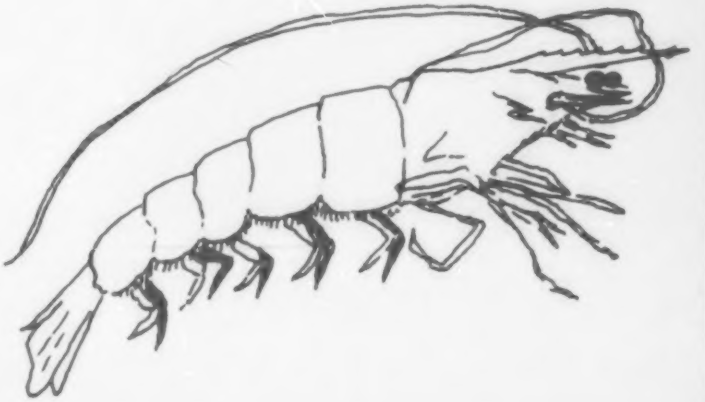


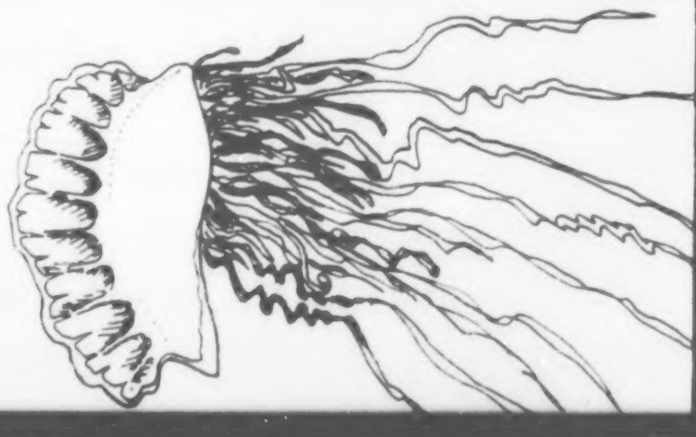


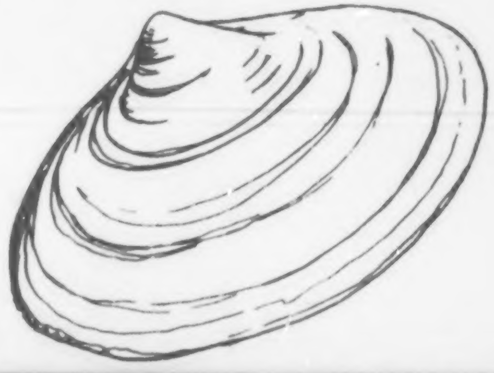












CRAB

SCALLOP

SHRIMP

CLAM

HORSESHOE CRAB

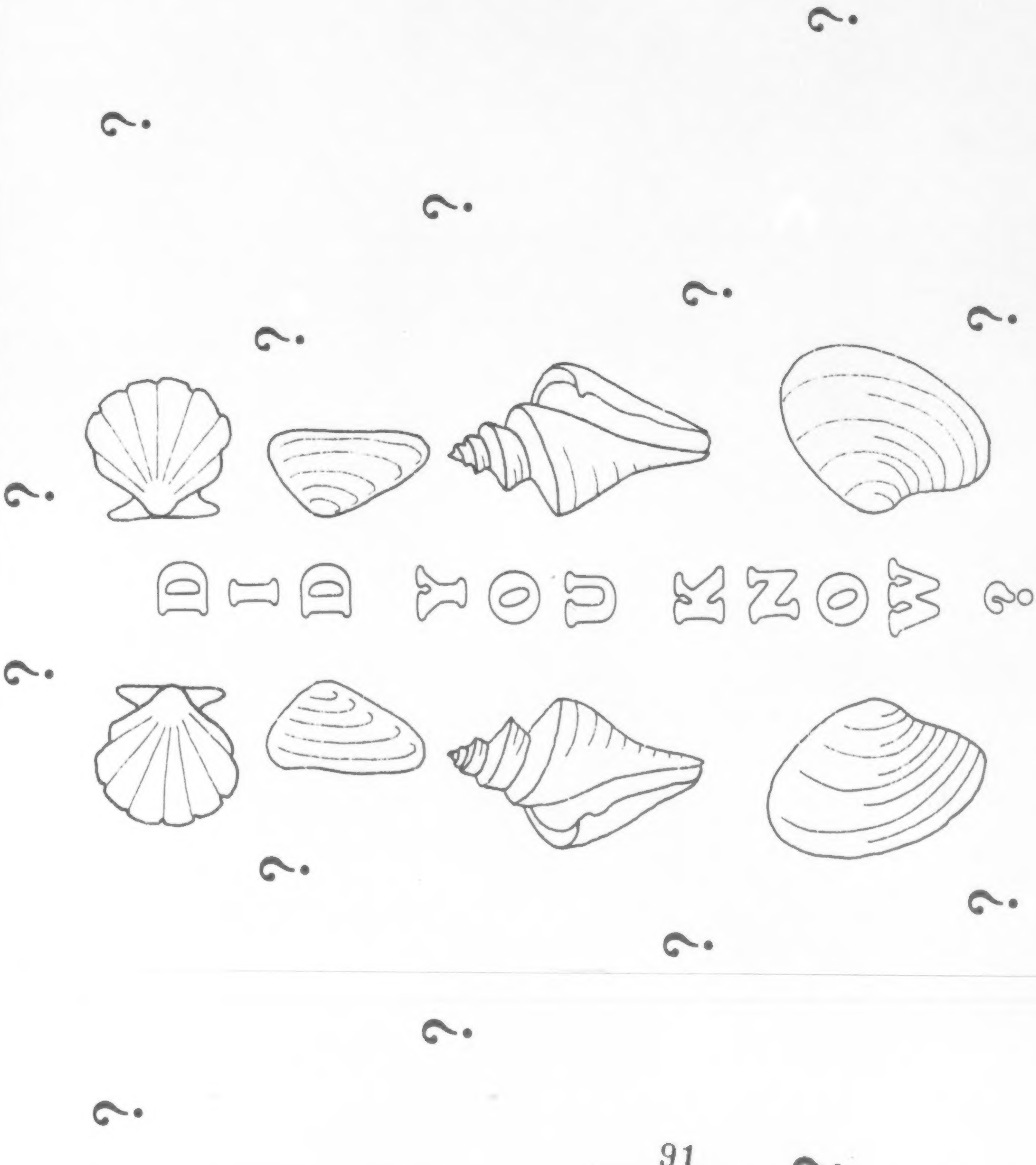
OYSTER

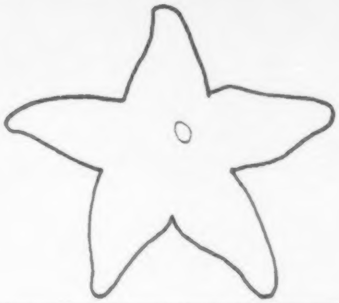
SEA URCHIN

PORTUGUESE
MAN-OF-WAR

K-2b
8.1

Decorate and wrap around a tennis ball or potato chip can.


DID YOU KNOW?



1. A mollusk's home is its ____________.

2. The body or fleshy part of the mollusk is the ____________.

3. A door which closes many univalves shells is called ____________.

4. The outer covering of the soft parts of a mollusk is ____________.

5. A shell composed of a single piece is called a ____________.

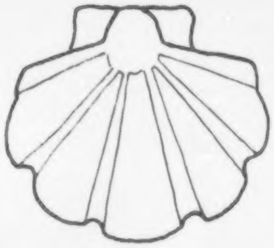
6. The place where the valves of a bivalve are joined is called ____________.

7. A shell with two valves is called a ____________.

8. The grinding machine just inside the mouth of most mollusks is the ____________.

9. The muscular part of the body used in movement is called the ____________.

10. The muscles which draw the two parts of a bivalve shell are ____________.



1. Part of the body through which food enters is the ____________.

2. Another word for pearly is ____________.

3. The organ through which water enters or leaves the body is the ____________.

4. Another word for scallop is ____________.

5. The part of the pecten shell known as the ear is ____________.

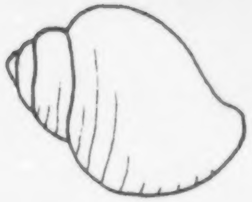
6. Dark colored threads of a mussel are called ____________.

7. The mollusk that has as many as 120 eyes is the ____________.

8. The things that help mollusks breathe are ____________.

9. Horny ribbon covered part of the mollusk with rows of tiny, hard covered teeth is ________

10. Mollusk are animals without ____________.



1. The word mollusk means ____________.

2. Scientist call mollusks ____________.

3. A scientist that studies shells is called a ____________.

4. All animals need ____________ to live.

5. Bivalve means ________.

6. Univalve means ________.

7. Mollusks have no ____________.

8. Mollusks are found all over the ____________.

9. Octopus are very ____________

10. Scallops have a row of ____________ around the edge of their mantle.

1. soft
2. invertebrates
3. conchologist
4. oxygen
5. two shells
6. one shell
7. spine
8. world
9. timid
10. eyes

1. mouth
2. nacreous
3. siphon
4. pecten
5. wing
6. byssus
7. scallop or pecten
8. gills
9. radula
10. backbones

1. shell
2. animal
3. operculum
4. mantle
5. univalve
6. hinge
7. bivalve
8. radula
9. foot
10. adductor muscle

ENRICHMENT SONG

OCEAN - (Tune of BINGO)

1. There was a scallop who had a home
The ocean was the place.
OCEAN OCEAN OCEAN
The ocean is the place.

2. He lives there with his other friends
The ocean is the place
OCEAN OCEAN OCEAN
The ocean is the place.

3. The water moves him left and right
The ocean is the place
OCEAN OCEAN OCEAN
The ocean is the place.

4. He's usually hiding in his shell
The ocean is the place
OCEAN OCEAN OCEAN
The ocean is the place.

5. Come to the sea and find him there
The ocean is the place
OCEAN OCEAN OCEAN
The ocean is the place.

K-2b
8.4

SCALLOPS OR PECTENS

Another name for the scallop is pecten. The pecten is a mollusk. They have one large muscle that is good to eat. They are bivalve mollusks. Either valve may have "wings" which stick out at either side near the hinge. Pectens are good swimmers. Pectens have eyes. These eyes are along the edge of the mantle. They may have as many as 120 eyes that peek out at you when the shell opens. Pectens or scallops are different colors. Some are ribbed and some are scalloped.

Now that you have read the above story, can you answer the following questions?

1. Another name for the scallop is ____________________.

2. The pecten has one large ________________ that is good to eat.

3. Pectens are good ________________________________.

4. Some pectens have as many as ___________eyes.

5. Pectens have ____________ on the valves that stick out on either side near the hinge.

6. Pectens are different ______________________.

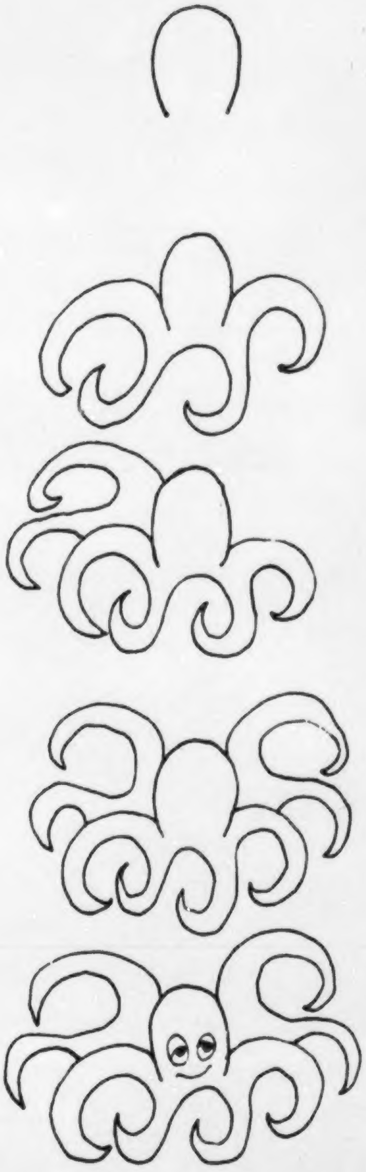
Name ______________________________

The octopus has eight arms.

The octopus has no shell.

The octopus can change colors.

An octopus can be 28 feet long.



1. What aninal has eight arms?

2. What sea animal has no shell?

3. What sea animal can change colors?

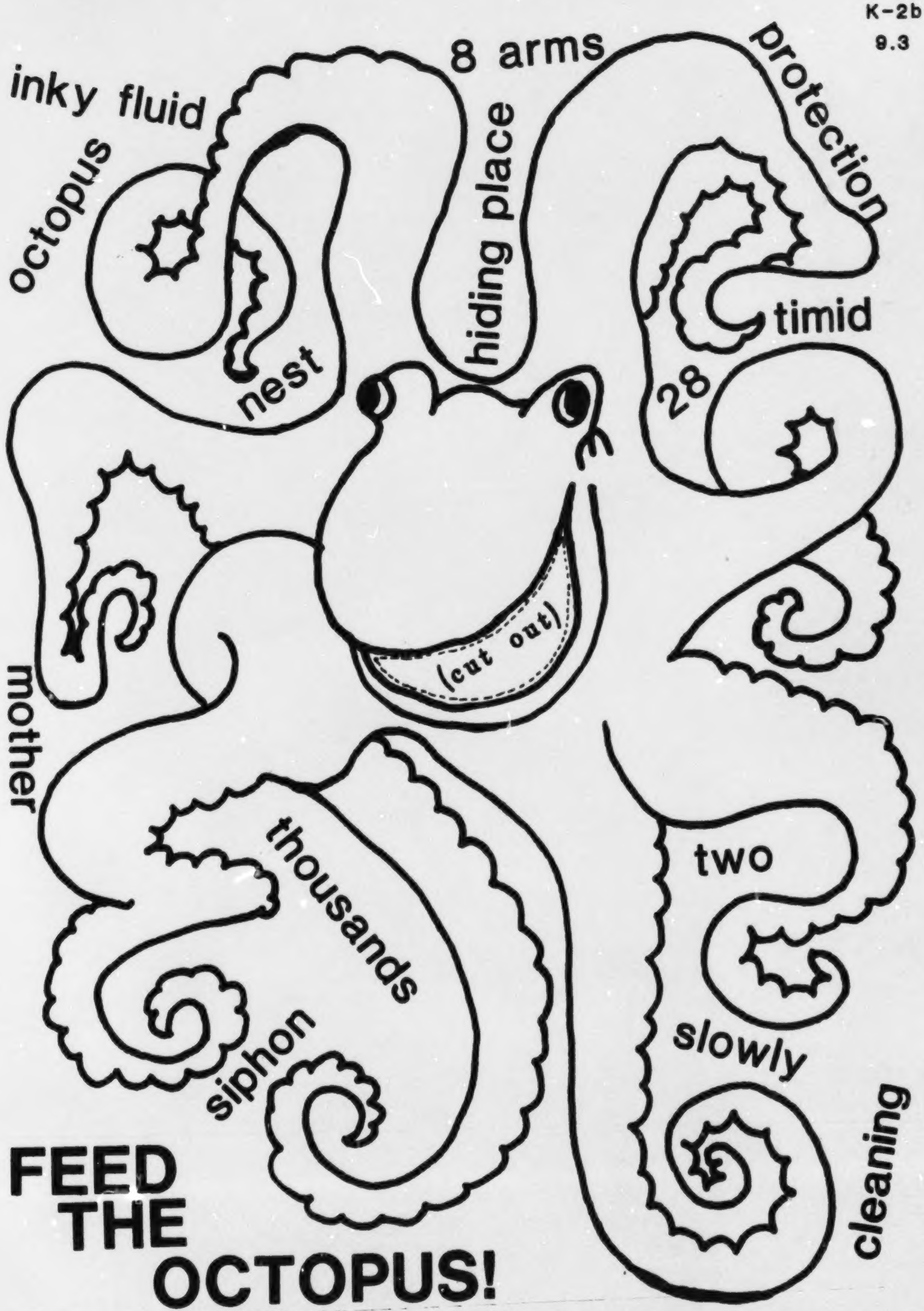
4. What sea animal can be 28 feet long?

K-2b
9.2

Name________________________________

Draw an octopus. Put blue water and other sea animals in your picture.

K-2b
9.3


8 arms
protection
inky fluid
octopus
hiding place
nest
timid
28
(cut out)
mother
thousands
two
siphon
slowly
cleaning

FEED THE OCTOPUS!

FEED THE OCTOPUS!-- playing pieces

An octopus moves ________.

The mother cares for her eggs by stroking and ________ them.

An octopus lays its eggs in a ________.

The mother octopus lays ________ of eggs.

The word octopus means ________.

The mother octopus finds a ________.

A method of ________ is to blend into the environment.

FEED THE OCTOPUS!--playing pieces

The octopus is very ________.

The ________ octopus treats her eggs in an unusual way.

The octopus has ______ methods of protecting themselves.

The octopus ejects an ________ ________ for protection.

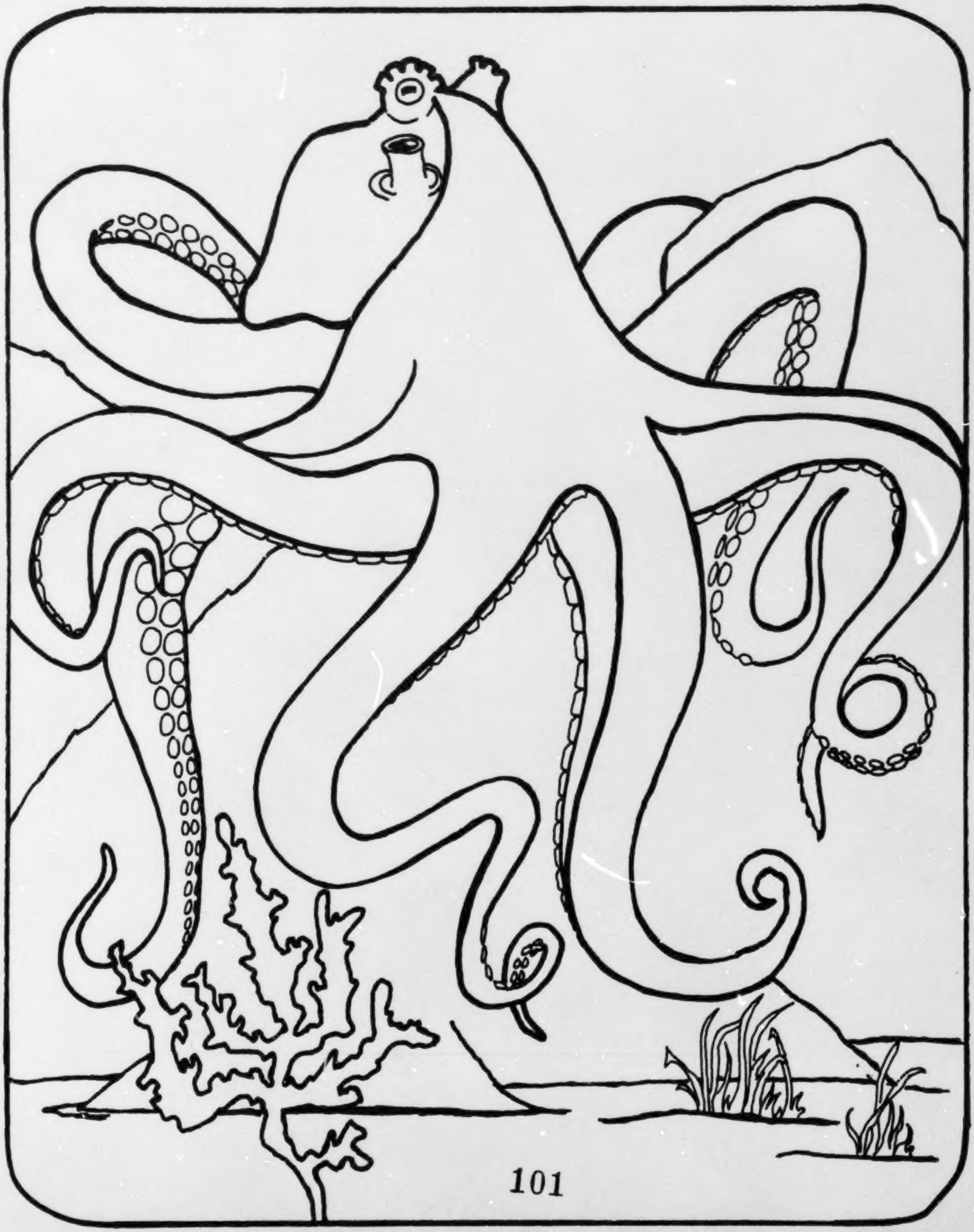
The octopus moves rapidly by taking in water and squirting it out through a ________.

The octopus can be ______ feet long.

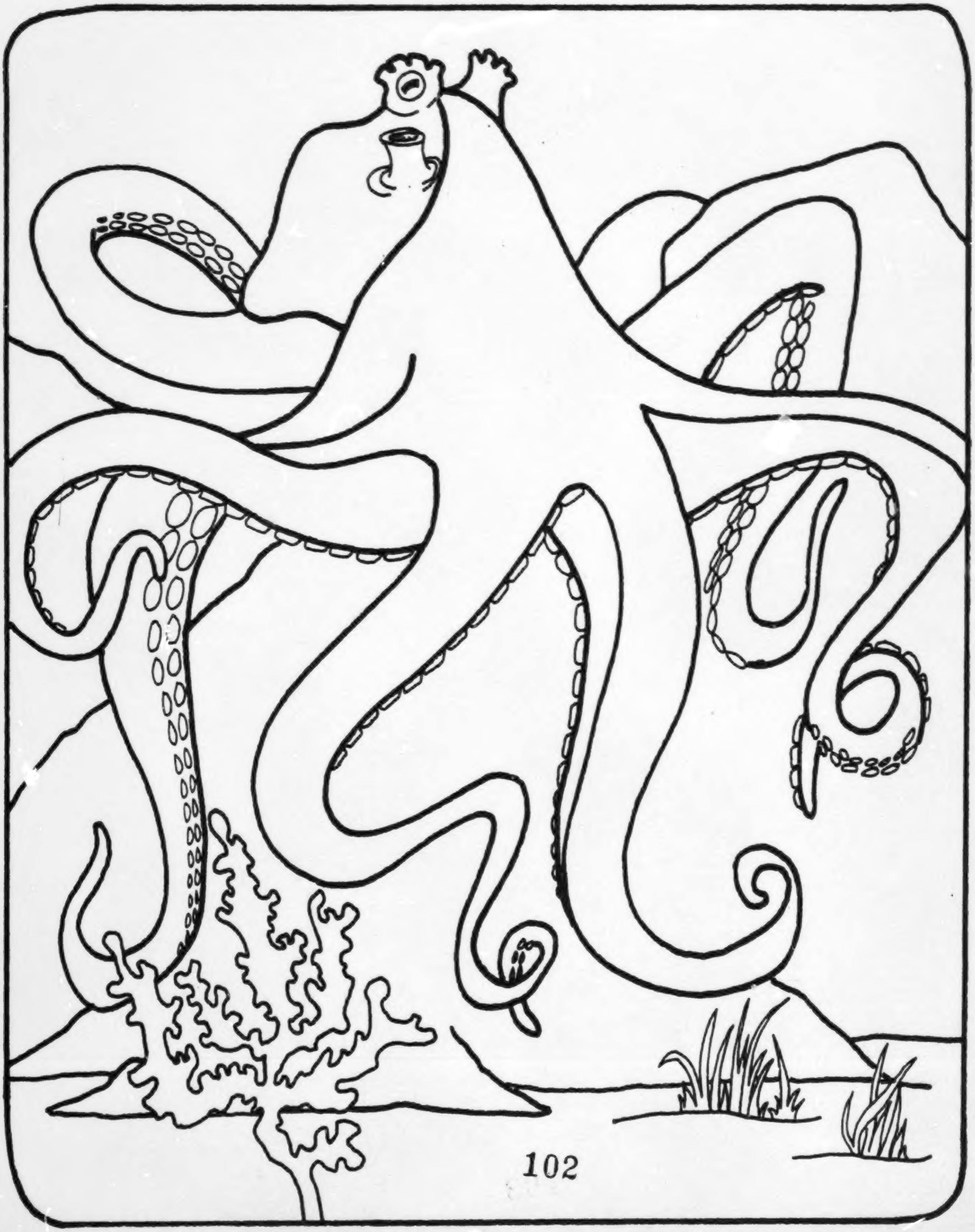
Which are the most highly developed soft bodied animals?

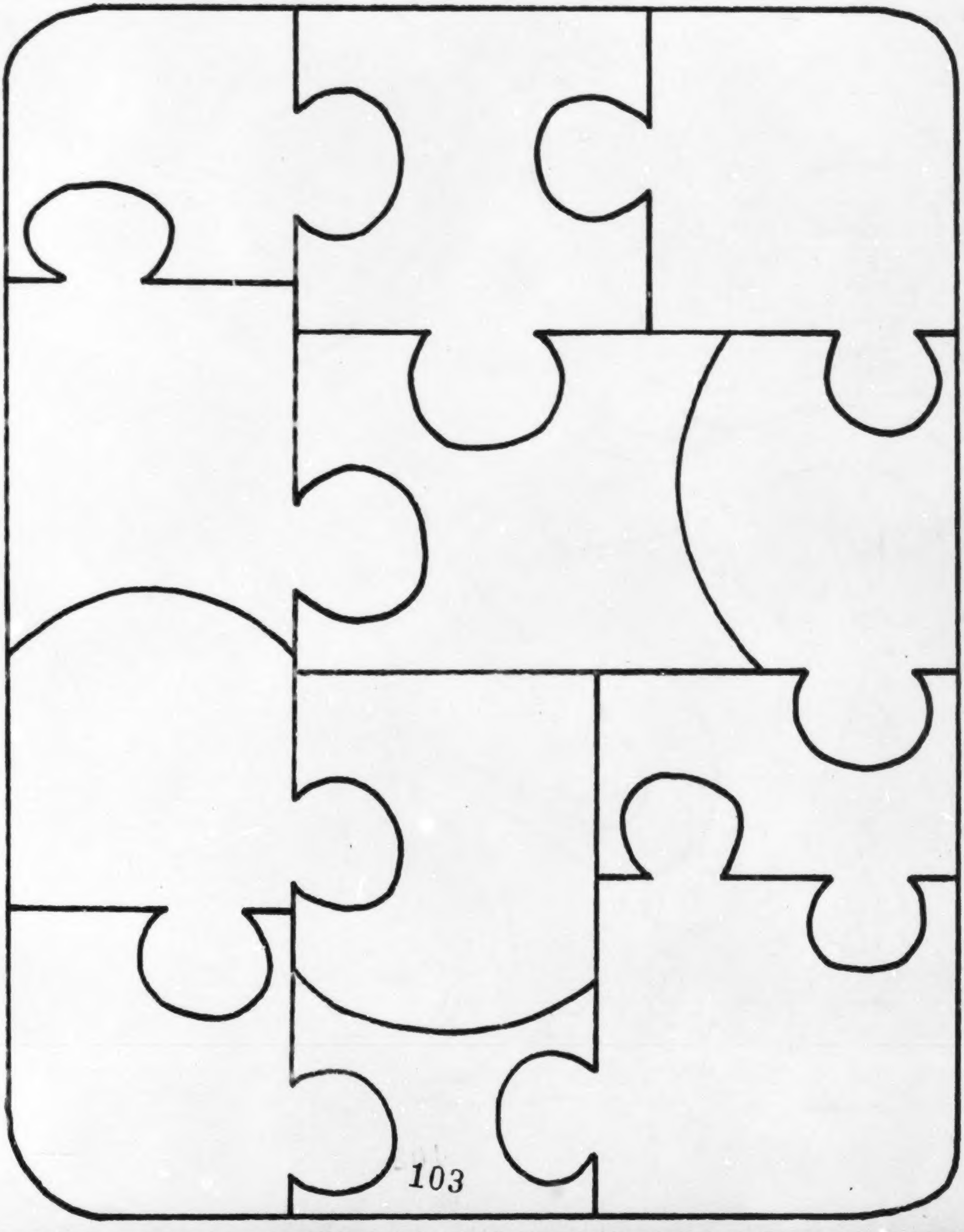
OLLIE OCTOPUS

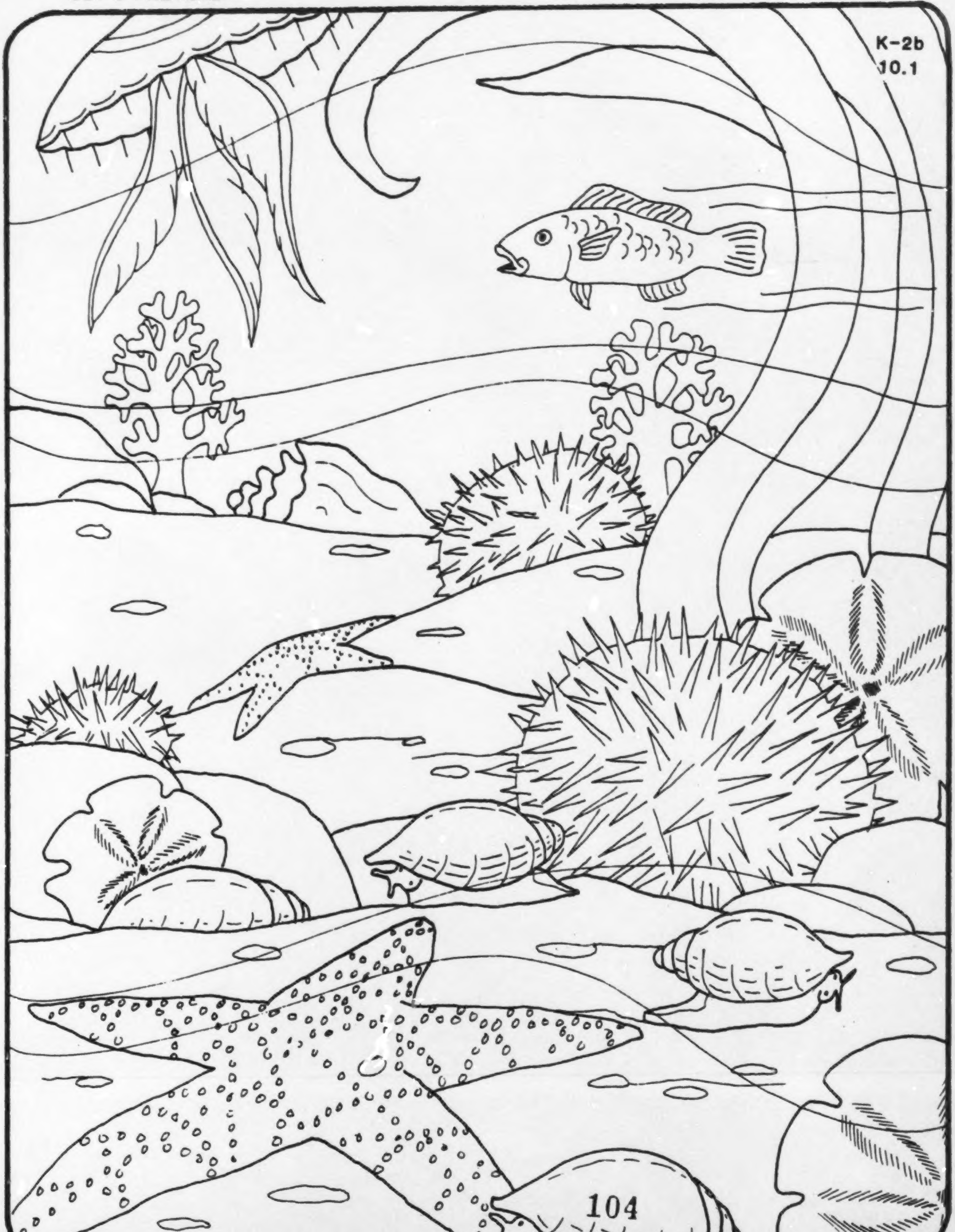
K-2b
9.6



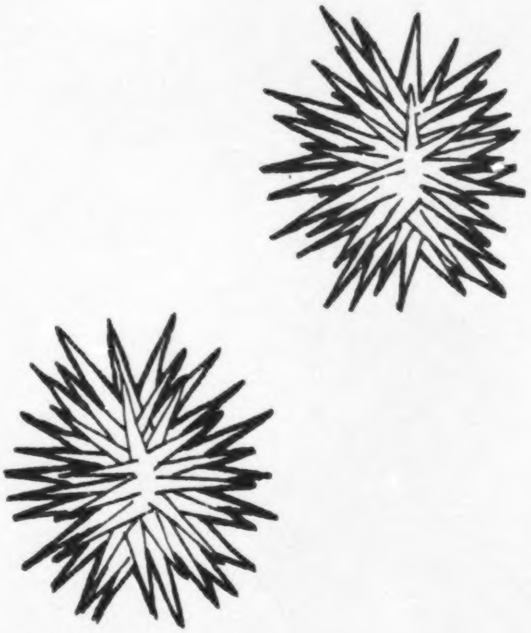
OLLIE OCTOPUS - puzzle pieces on back

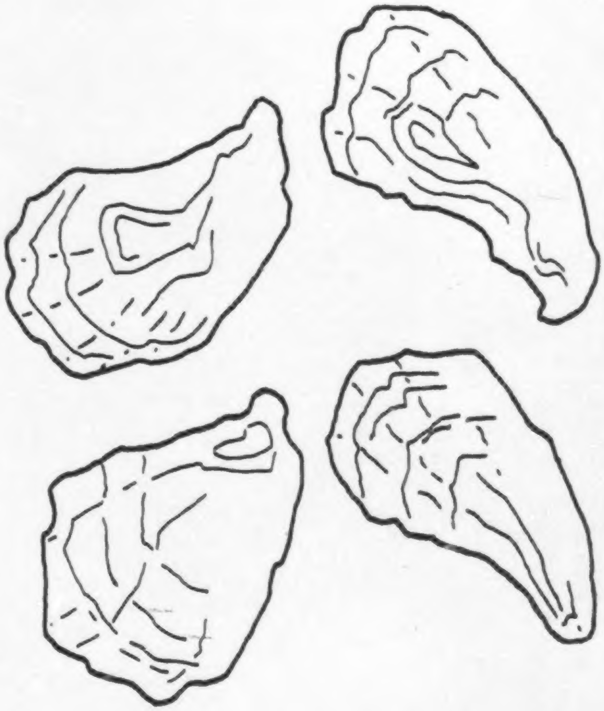


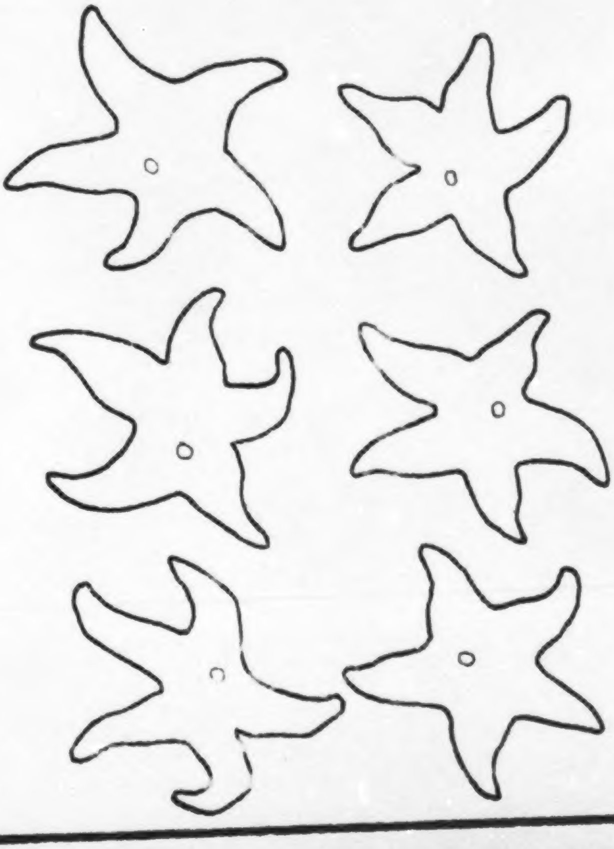


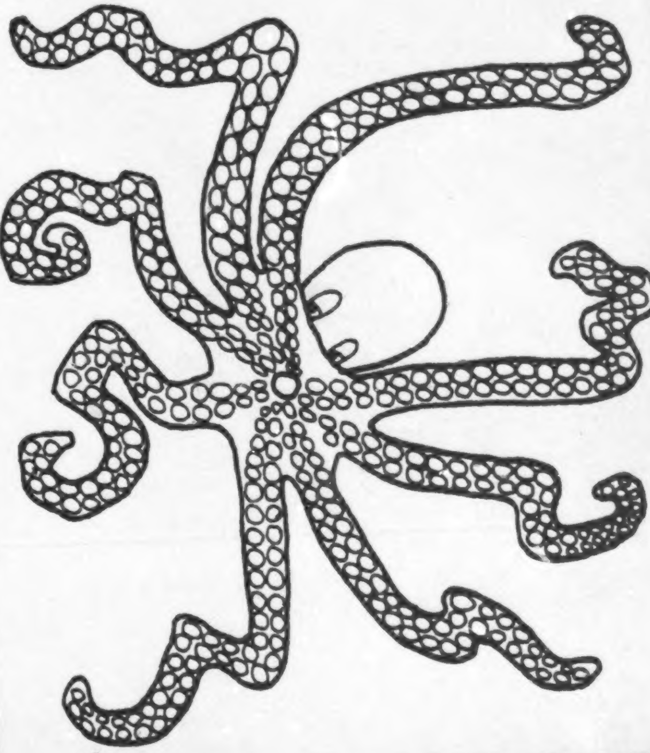

K–2b
10.1

K-2b
10.2









1

ONE

OCTOPUS

4

FOUR

OYSTERS

6

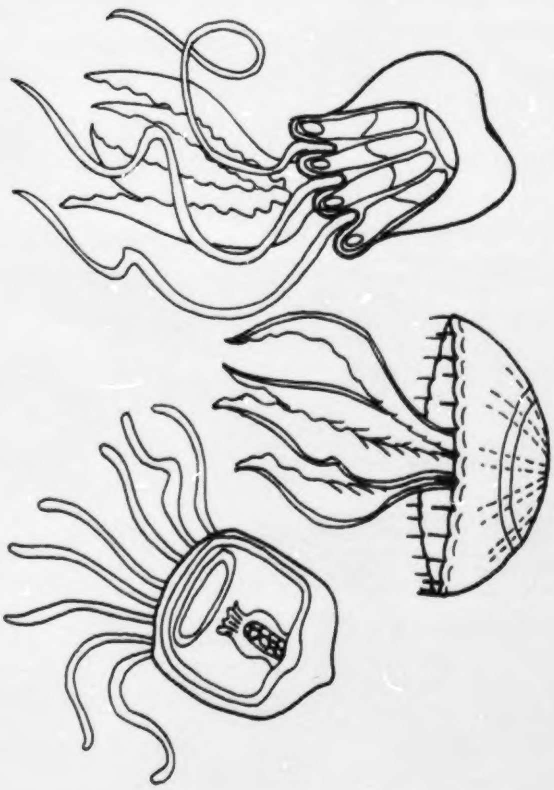
SIX

STARFISH

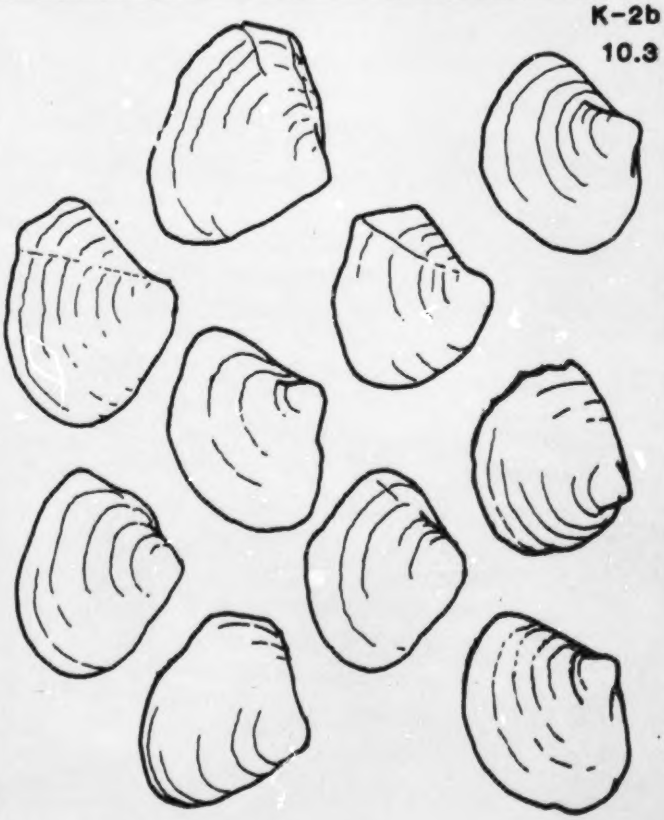
2

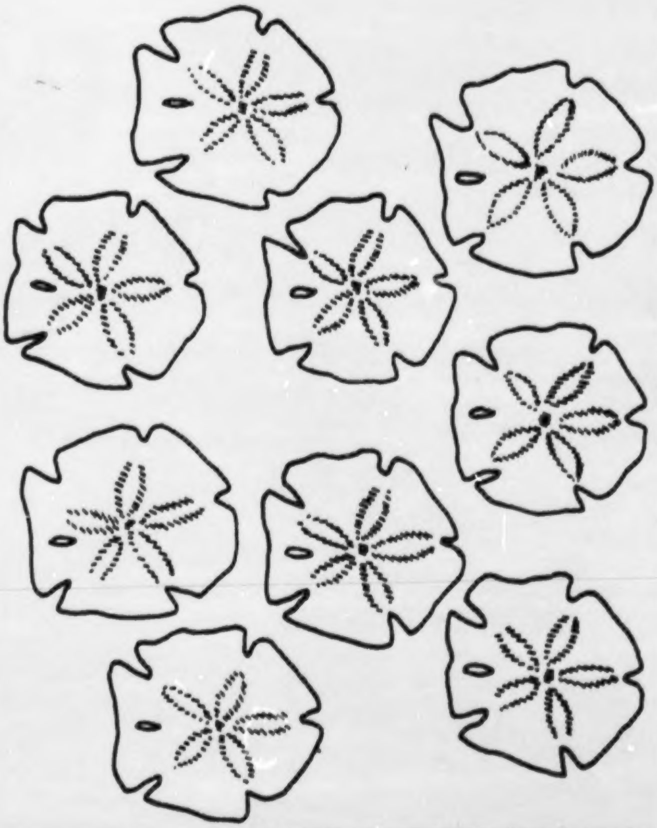
TWO

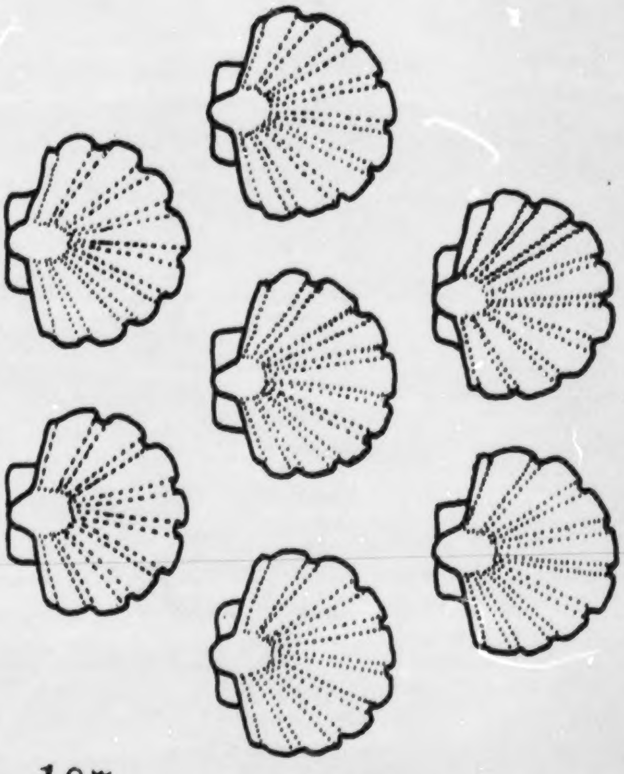
SEA URCHINS



K-2b
10.3







7

SEVEN

SCALLOPS

10

TEN

CLAMS

9

NINE

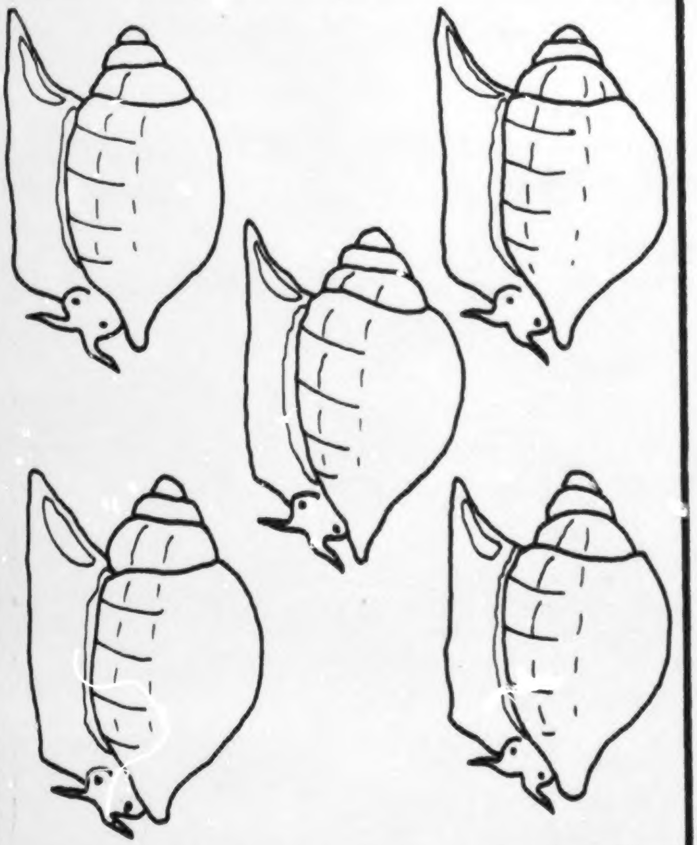
SAND DOLLARS

3

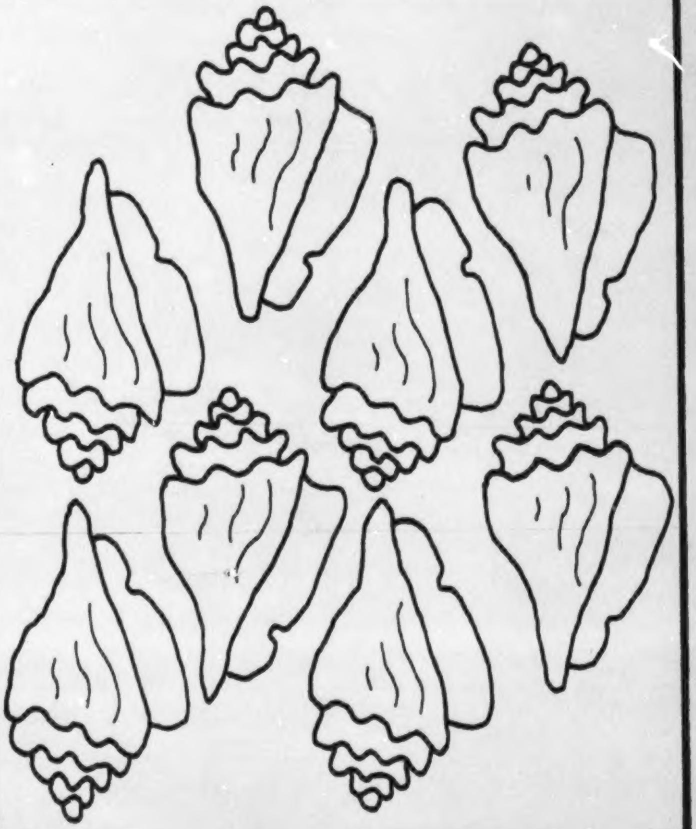
THREE

JELLYFISH

LET'S PRETEND-- Math Counting Cards



K-2b
10.4



8

EIGHT

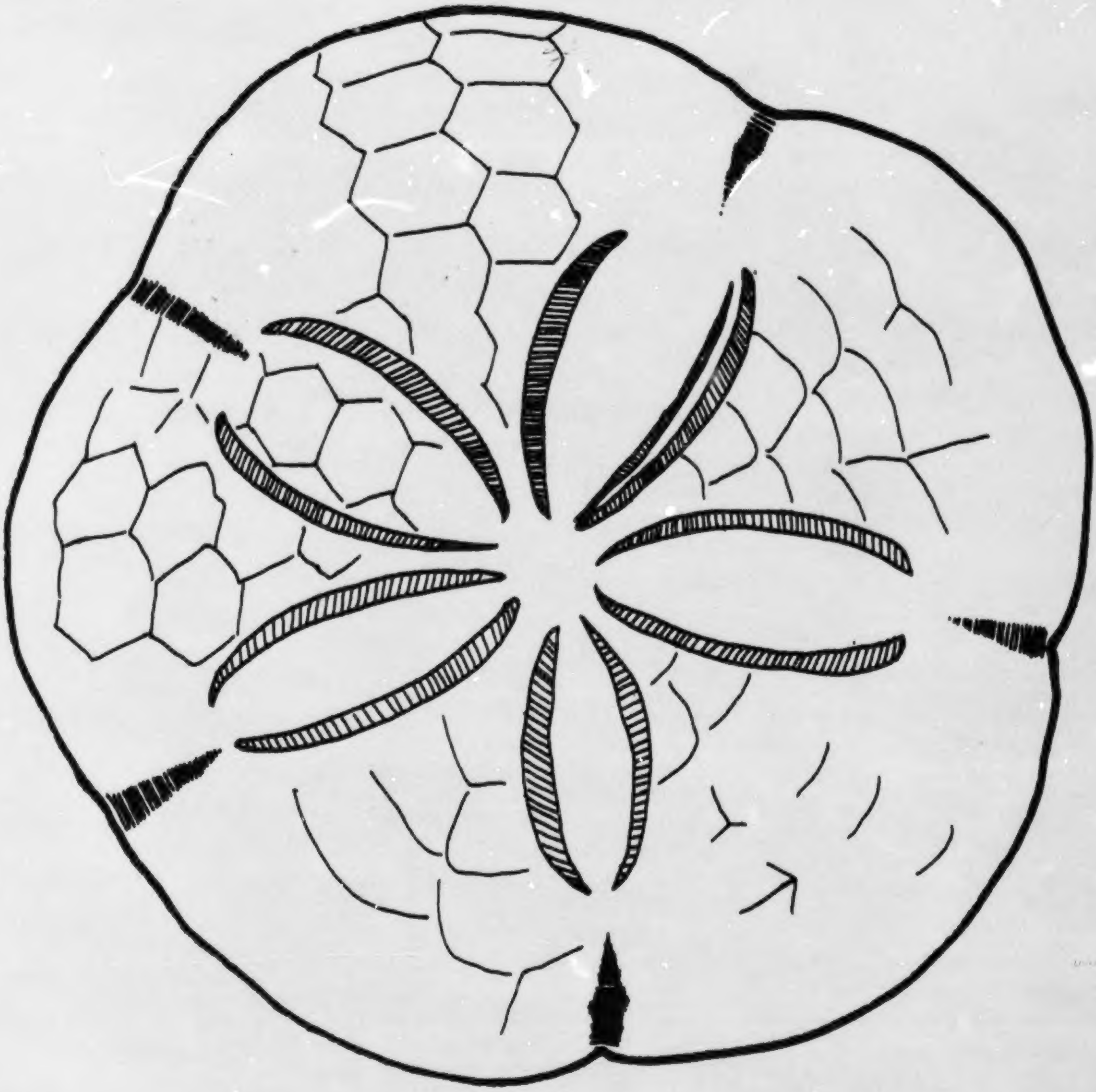
CONCHS

5

FIVE

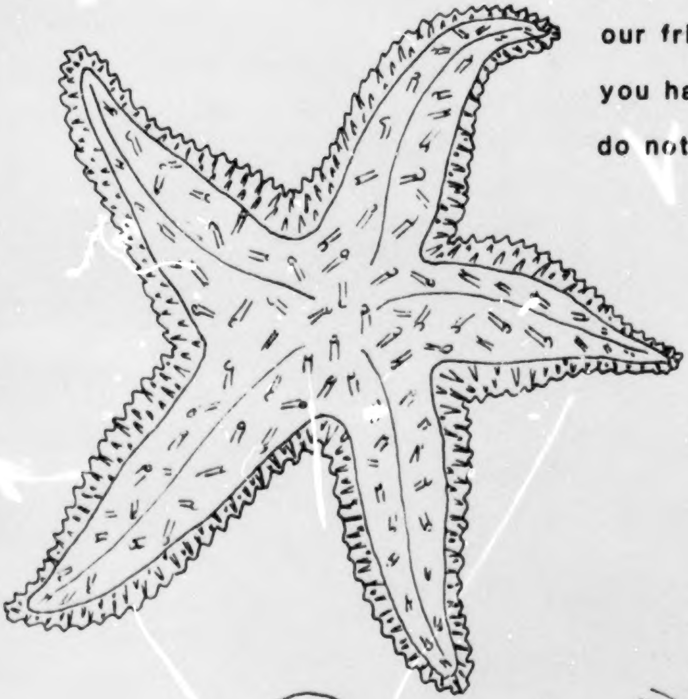
SNAILS

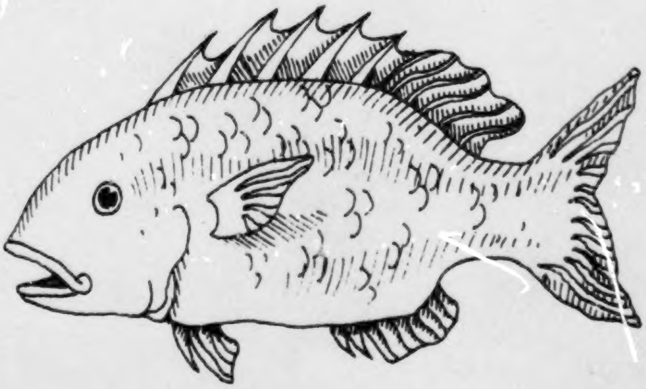
SAND DOLLAR

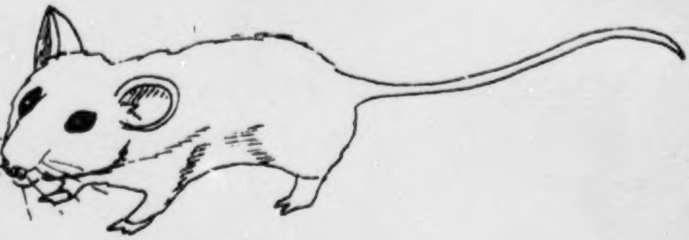


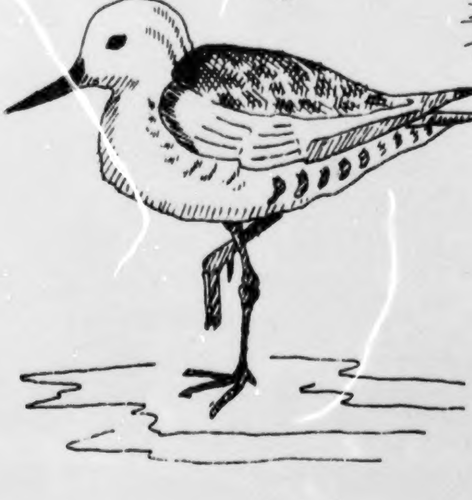
DO I BELONG?

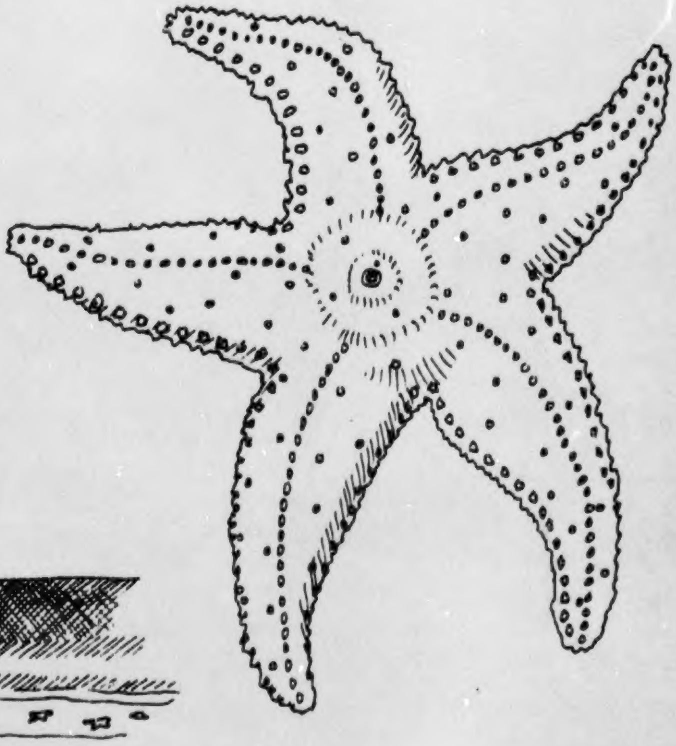
Circle all the pictures that we have learned about our friend the starfish. Color each picture that you have circled. Put an X on the pictures that do not belong.

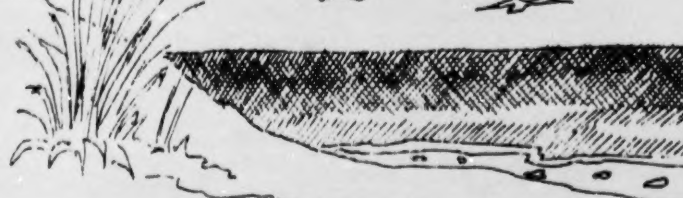






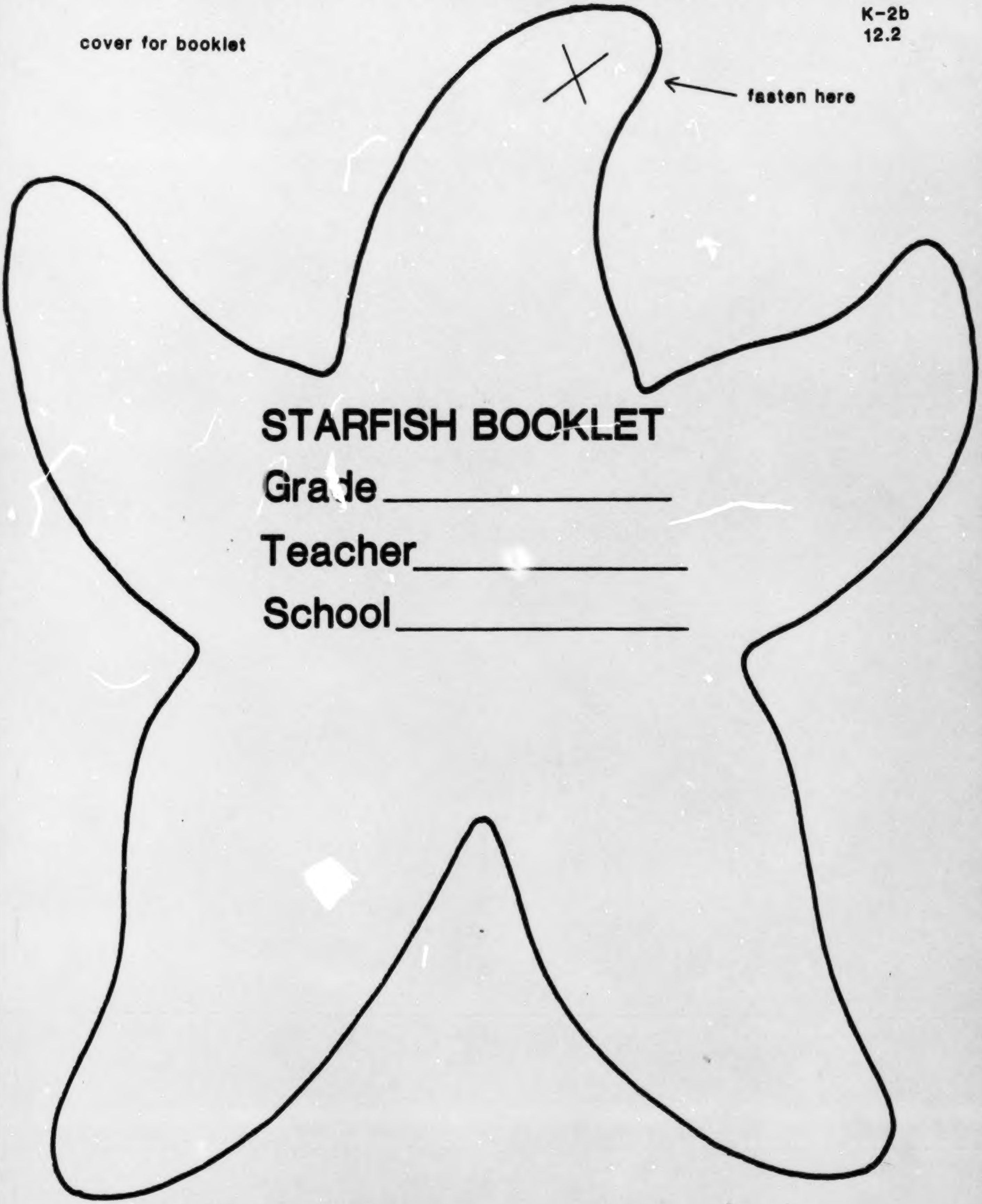






cover for booklet

K-2b
12.2


X
fasten here

STARFISH BOOKLET

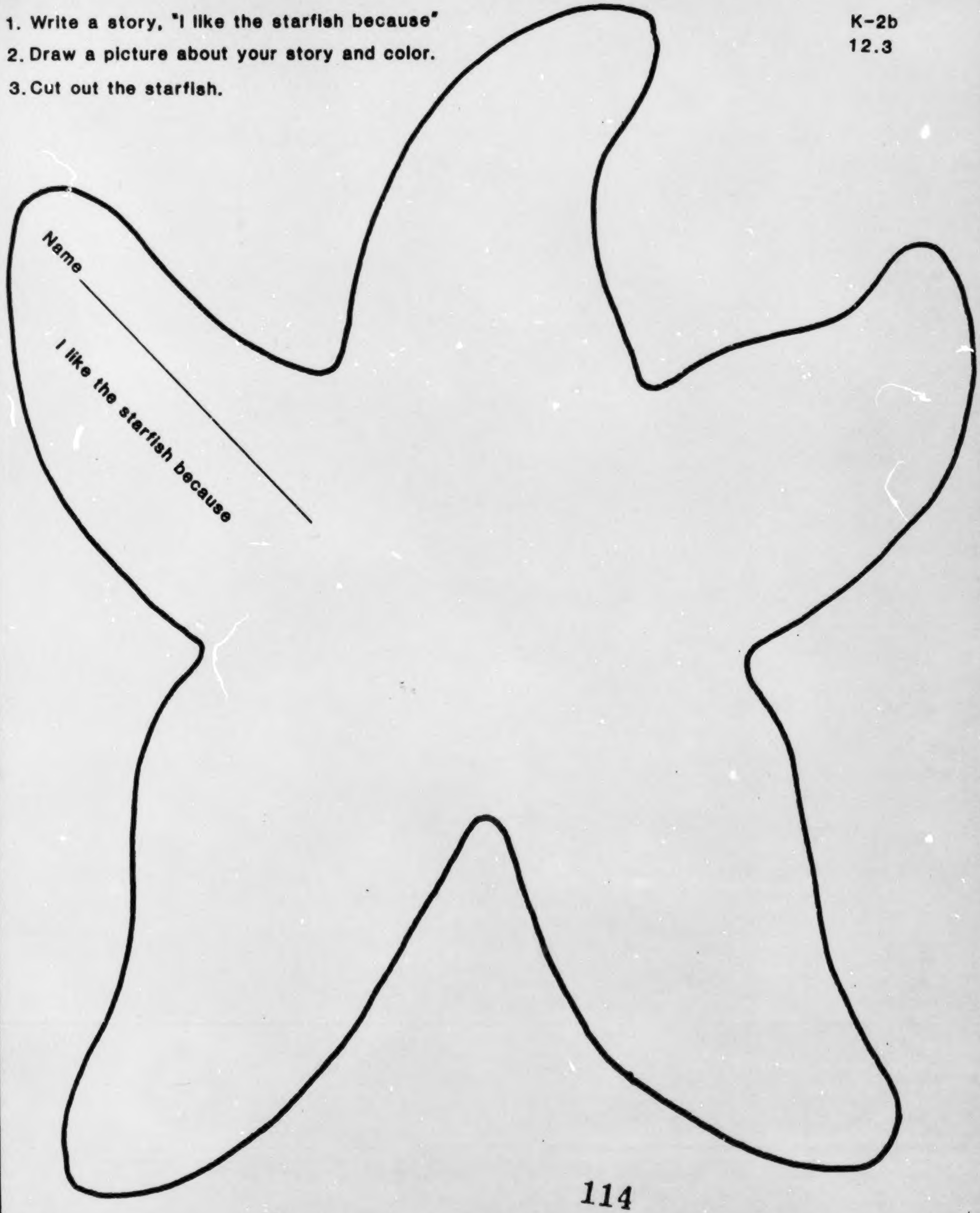
Grade ____________

Teacher ____________

School ____________

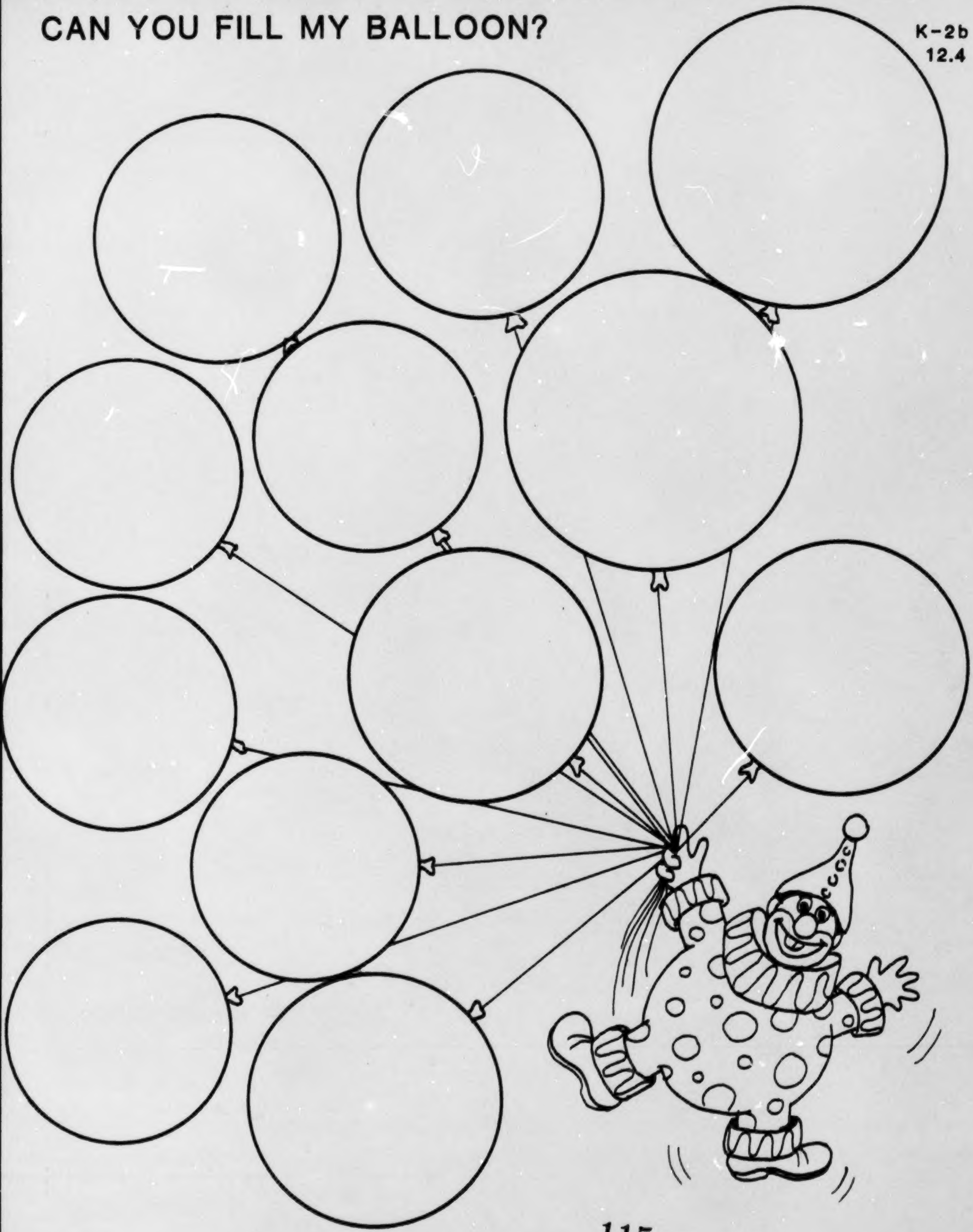
K-2b
12.3

1. Write a story, "I like the starfish because"
2. Draw a picture about your story and color.
3. Cut out the starfish.


Name ______________________________
I like the starfish because

CAN YOU FILL MY BALLOON?

K-2b
12.4



CAN YOU FILL MY BALLOON?--game pieces

Cut out cards and glue each question to a balloon on the game board before laminating.

I live in the ocean.

____

1

I have

____

arms or rays.

2

I may even

____

another starfish.

4

I eat

____

____

________________.

3

I am an enemy
of the starfish.

____

5

I am an enemy of the
starfish, too.

____

6

CAN YOU FILL MY BALLOON?--game pieces

I have an
____
on the end of
each of my arms.
7

On the bottom of
each arm, I
have many little
__________.
8

My eyes
see only
__________.
9

I move along the
____
of the ocean.
11

I can be green,
purple, brown,
__________,
__________,
__________.
10

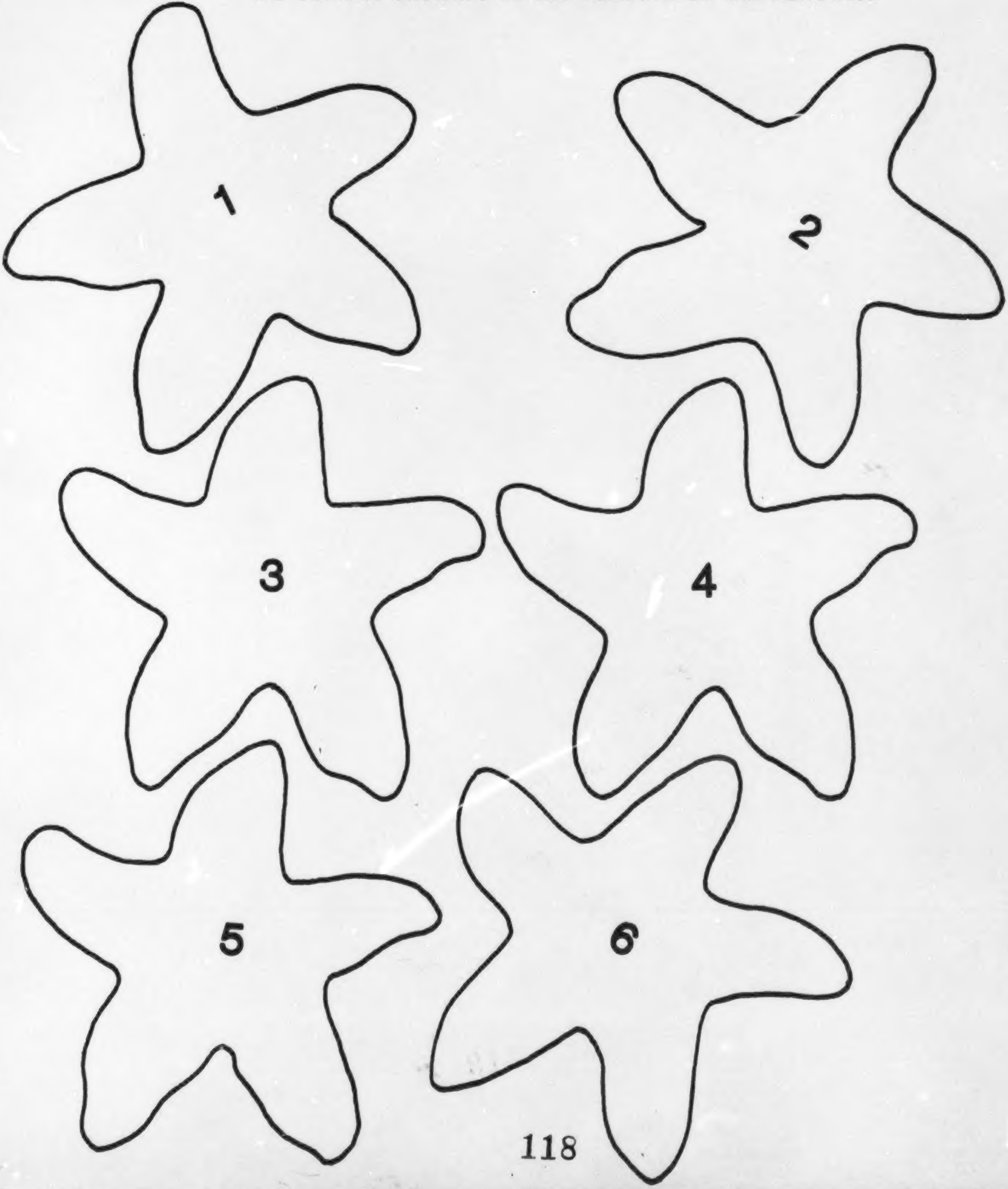
I can grow another
__________.
12

CAN YOU FILL MY BALLOON?--question cards

K-2b
12.7

Check your answers,

The corresponding numers on the starfish have the correct answers to the numbers on the balloons.



5

five

starfish

eat

mollusks,
crustaceans,
injured animals

menhaden

seabird

CAN YOU FILL MY BALLOON?--question cards

K-2b
12.8

tube feet

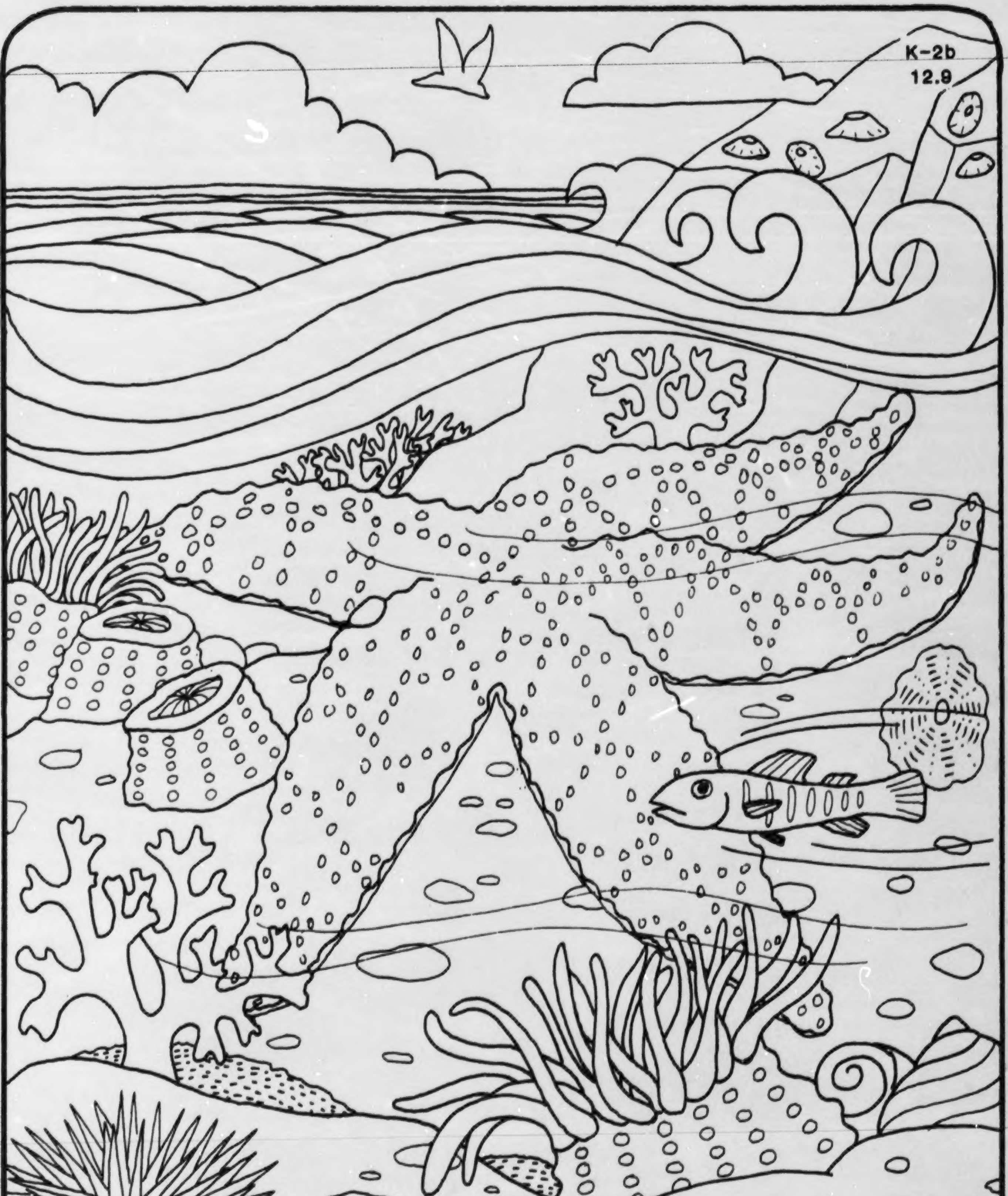
orange,
red,
yellow

arm or ray

eye

light

bottom


K-2b
12.9

Hello boys and girls,

I am Dangerous Dan Jellyfish. I live in the ocean. I am going to tell you something about myself. The first thing you need to know is that I am VERY DANGEROUS. My colors can be red, yellow, blue or green. I may have stripes or spots or I may be clear. As pretty as I may appear, please don't pick me up. I can make you feel very sick. I can give you cramps or even take your breath away. If you feel a prickly sensation while swimming, I may have stung you. I will not attack you, but my tentacles will sting anything that touches me.

I come in many shapes and sizes. I might be in the shape of a moon, an umbrella or a cube. I am going to tell you some things you need to know about me so you won't be too curious. My body is like a heart. When it moves, it pumps water in and out. The water carries food and oxygen to all parts of my body. My body is mostly water, but the part that is not makes my jelly. I am like a sandwich made of two bags with jelly in between. One bag is the skin that protects the outside of my body, the other is the skin that forms my stomach. My stomach makes up a large part of my body. My mouth is on the bottom of me. My stinging tentacles surround my mouth. I have oral arms that hang down from my body. I trap food with both of these. Because my body is mostly a stomach with a mouth, I could be compared to a bag. I will eat anything that is small enough to fit into my mouth. I eat fish, shrimp, little crabs, worms and even other jellyfish. There is something very strange about me. If I can't find enough food, I will shrink and become a tiny jellyfish again. As soon as I can find food, I will start to grow again. When I am hunting for food, I sink in the water and trap food on the underside of my body and my oral arms carry the food to my mouth. Other relatives of mine eat small animals and other jellyfish by capturing them with tentacles. We usually do not eat fish. In fact, some small fish hide under us for protection.

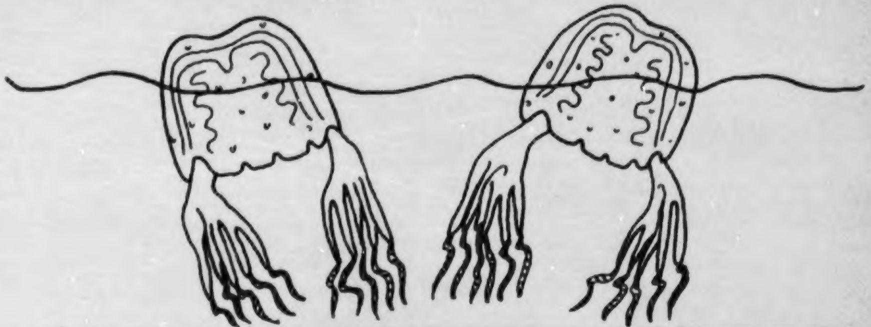
Another hollow cavity animal you have heard about is one of my distant cousins, the Portuguese Man-of-War. The Portuguese Man-of-War is really many of the same animals living together as a colony performing different jobs. Some of the animals form the balloon-like float and others have stinging tentacles to catch fish. Portuguese Man-of Wars eat mackerel and flying fish. If a swimmer accidentally bumps into a large colony it can be painful and death may occur from drowning.

I must tell you about the most dangerous of my relatives, the Sea Wasp, who is more poisonous than the Portuguese Man-of-War. Sea Wasps live in the waters of Northern Australia.

Boys and girls, you now know enough about me that you won't ever pick me up or step on me with your bare feet. If you see me in the water or on the beach remember what you have learned about me.

K-2b
13.3

JELLYFISH PUZZLE



VOCABULARY

cube
tentacles
jellyfish
poison
seawasp
oxygen
victims

1. Dangerous Dan is a ______________________.

2. Jellyfish may be in the shape of a _______________.

3. The _________________ is the most dangerous jellyfish.

4. The water brings food and _____________ to my body.

5. I catch my victims with my stinging __________________.

6. The ______________ in my tentacles can make you sick.

7. The small animals I eat are my__________________.

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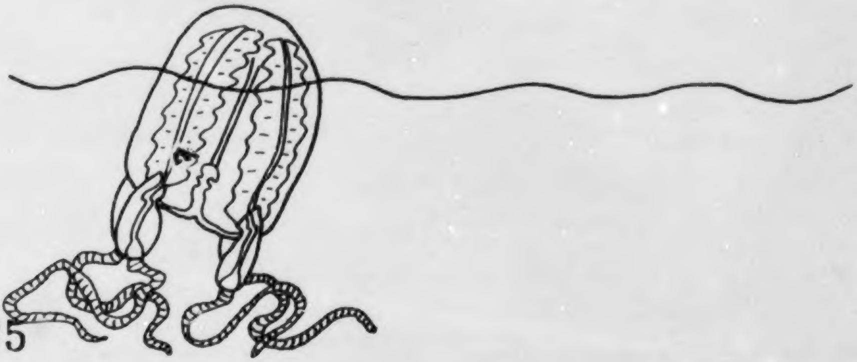
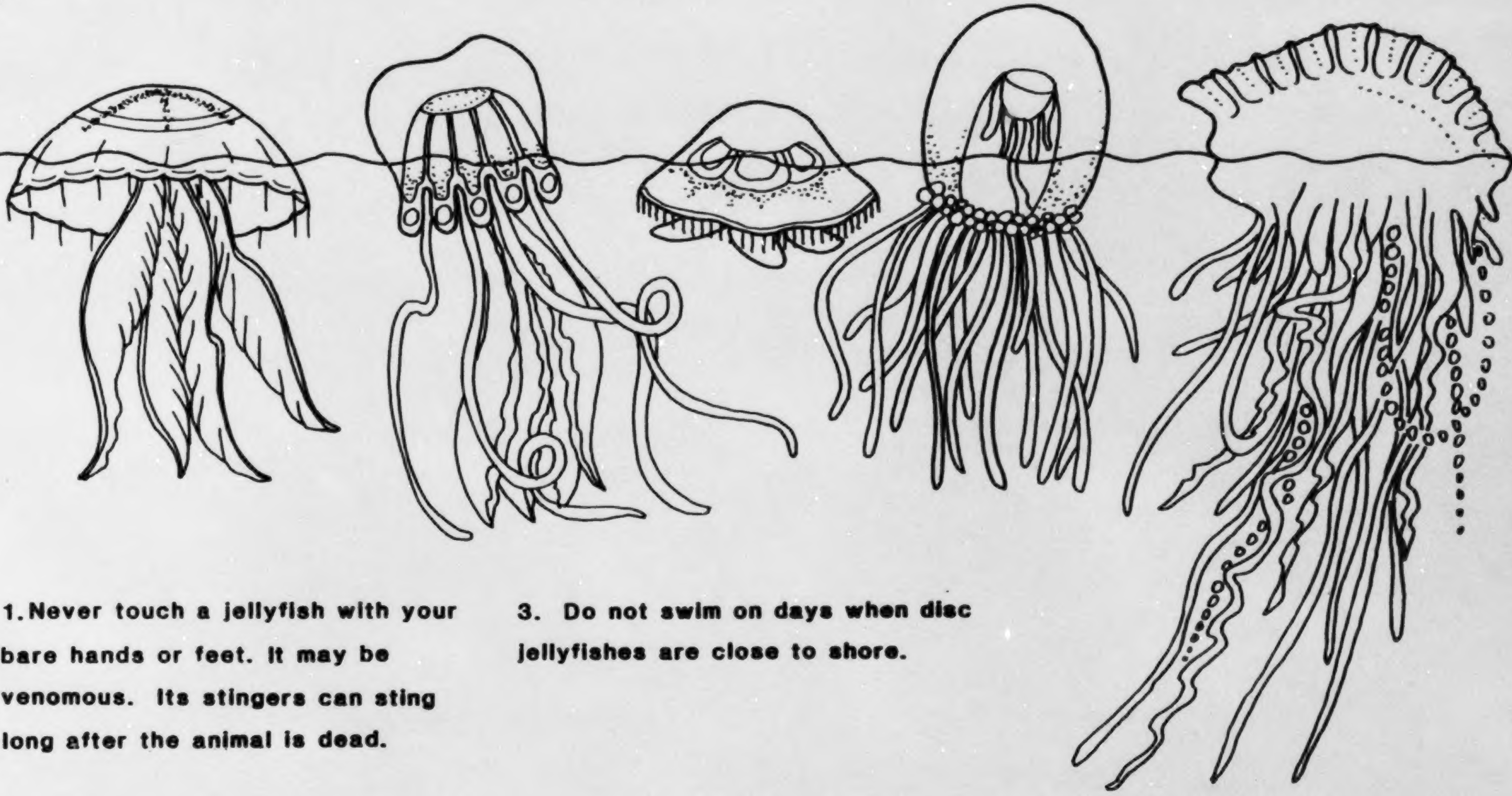


DIRECTIONS

Use the vocabulary words at the top to fill in the blanks in the puzzle and sentences. The word you choose must fit the same number puzzle and sentence.

LET'S AVOID A JELLYFISH STING



1. Never touch a jellyfish with your bare hands or feet. It may be venomous. Its stingers can sting long after the animal is dead.

2. Never touch a cube jellyfish or a floating colony such as the Portugese Man-of-War.

3. Do not swim on days when disc jellyfishes are close to shore.

4. Do not swim in the ocean if a Portugese Man-of-War or a cube jellyfish is reported.

5. Avoid warm, tropical waters after a storm. Broken tentacles may hurt.

REMEDIES FOR JELLYFISH STINGS

1. Get out of the water if you feel a light prickling sensation anywhere on your body. Some jellyfish may give you cramps or take away your breath.

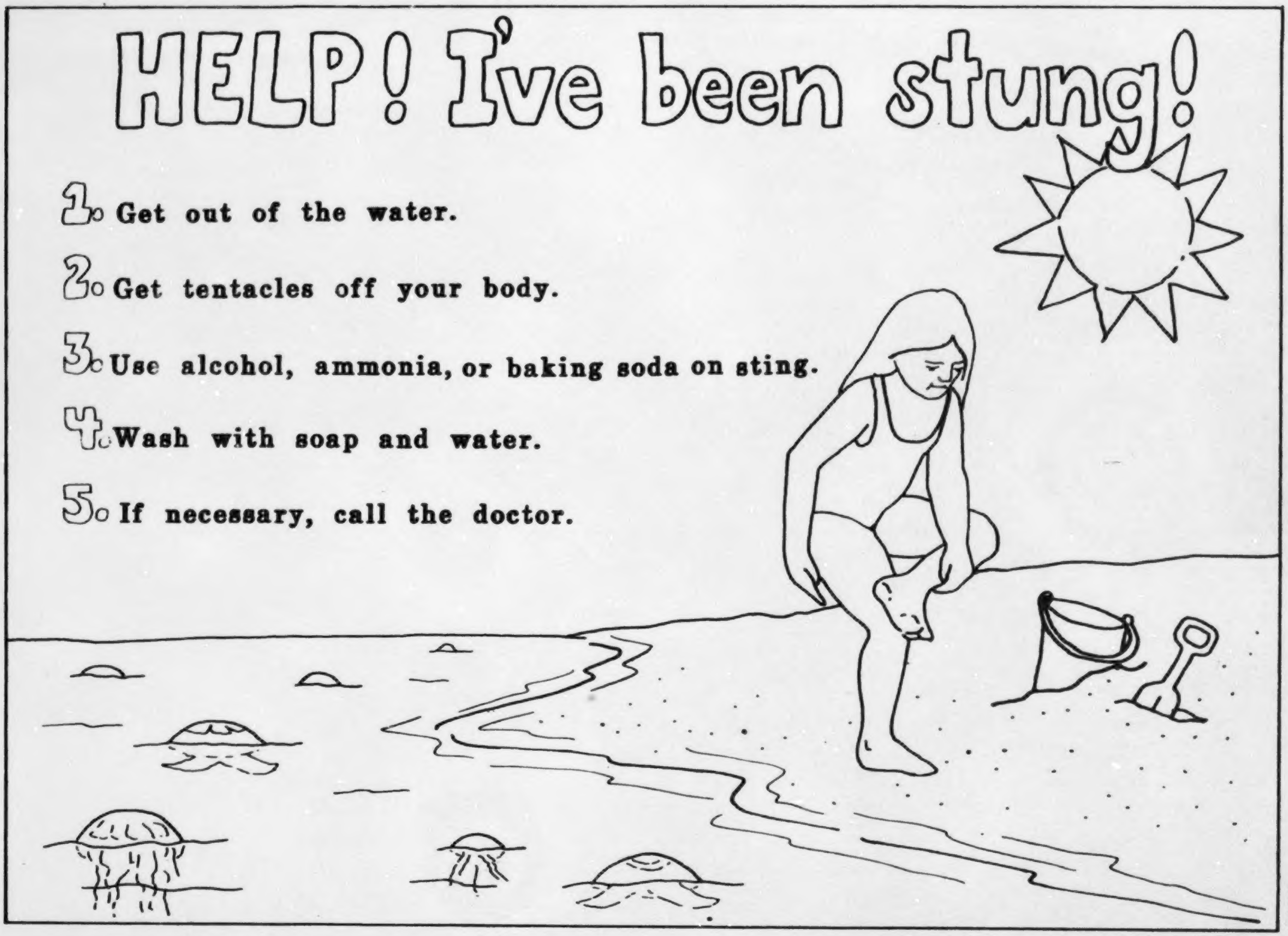
2. Prevent tentacles which may cling to your body from stinging you again. Do not scrape the tentacles off with your bare hands. Use a towel, seaweed or a handfull of sand to gently brush away any tentacles that may cling to your skin. Do not rub the area. Rubbing will cause more of the venom to be absorbed.

3. Pour rubbing alcohol over the stung area to destroy any stinging cells that remain. Other materials that could be used are household ammonia or baking soda dampened with fresh water.

4. After the stinging sensation goes away, wash the area with soap and fresh water.

5. If the stinging sensation remains or you feel sick or weak, call your doctor.

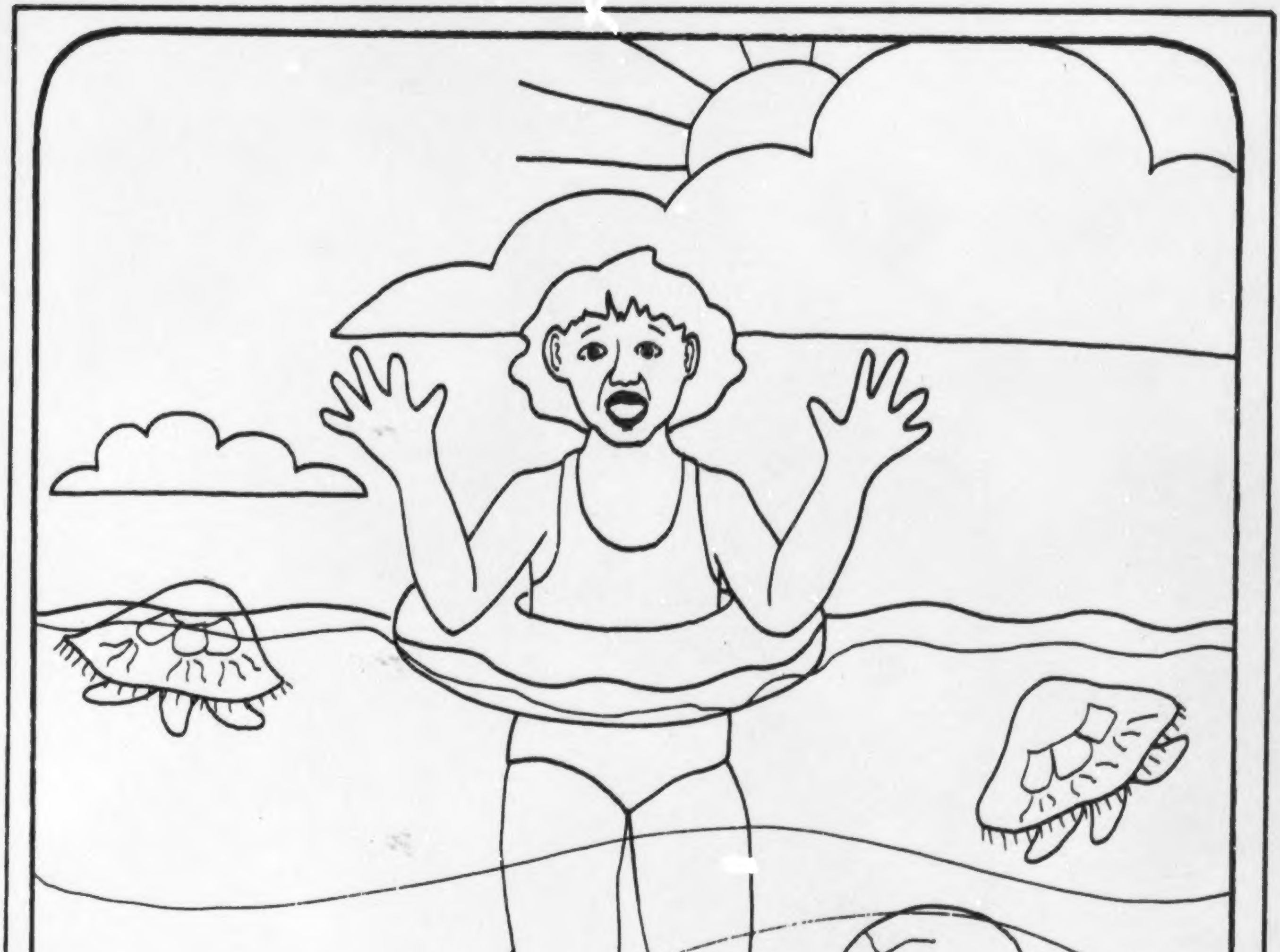
Poster or Bulletin Board Idea--JELLYFISH STINGS



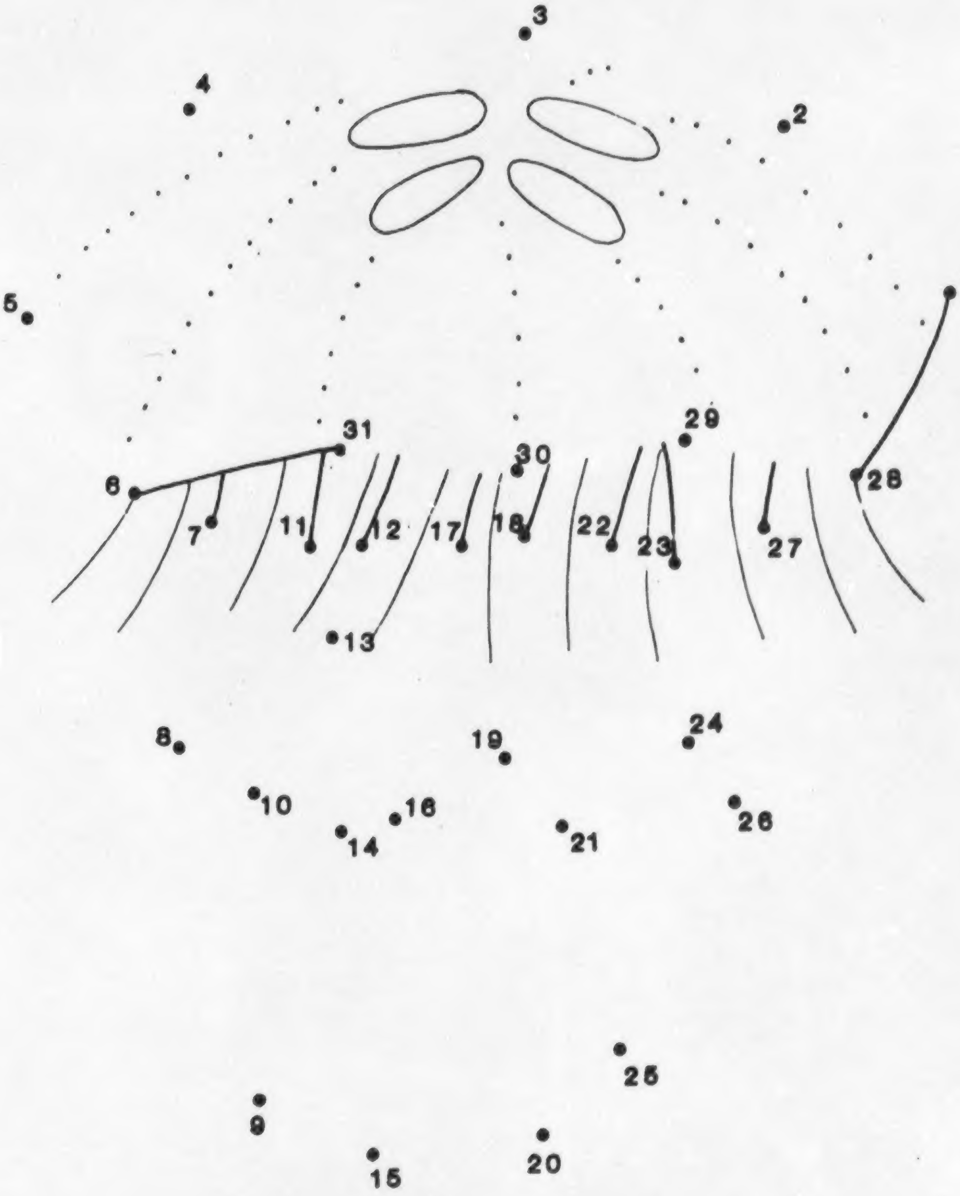
HELP! I've been stung!

1. Get out of the water.
2. Get tentacles off your body.
3. Use alcohol, ammonia, or baking soda on sting.
4. Wash with soap and water.
5. If necessary, call the doctor.

WHAT'S HAPPENING? Color the picture and write a story about it.



WHO AM I?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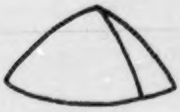
I CAN BE VERY DANGEROUS:

1. AFTER YOU CONNECT THE DOTS, COLOR ME.
2. I AM A ______________________________.
3. DON'T LET ME STING YOU WITH MY
______________________.

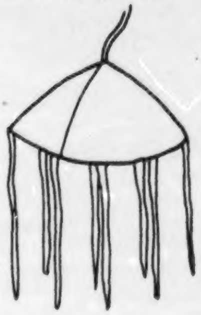
K-2b
15.1

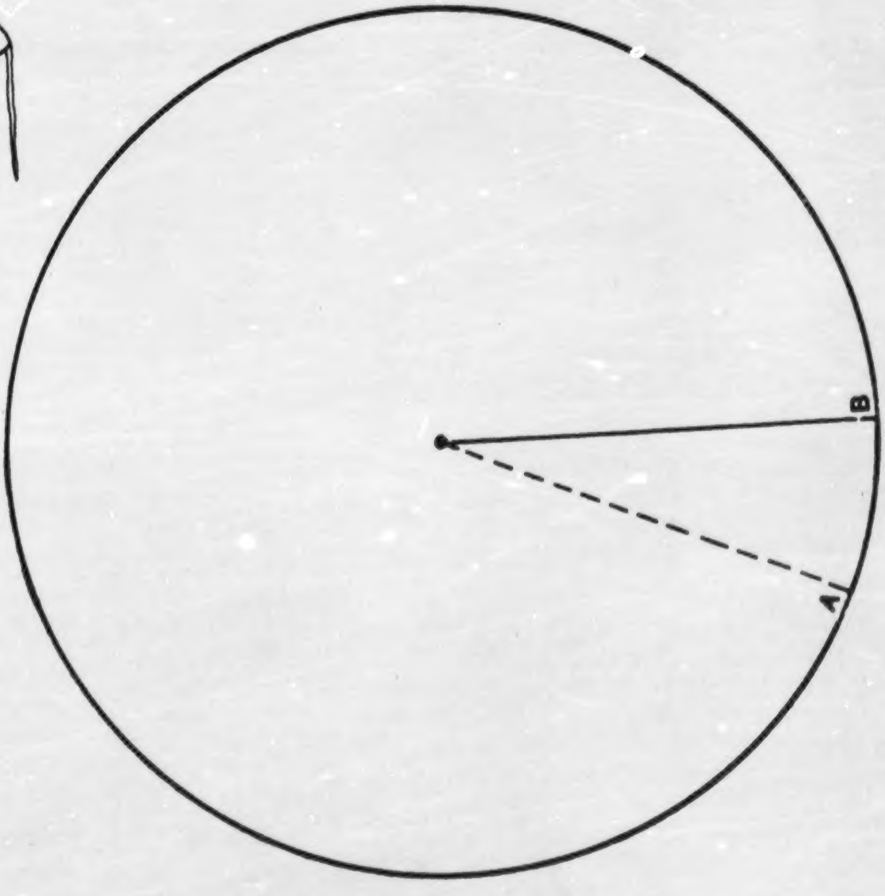
MAKE A JELLYFISH

1. Cut out the pattern.
2. Cut on the dotted line to the center dot.
3. Fold the end marked with an A to the end marked with a letter B.
4. Glue or staple the paper at the B.
5. You now have a cone that looks like this:



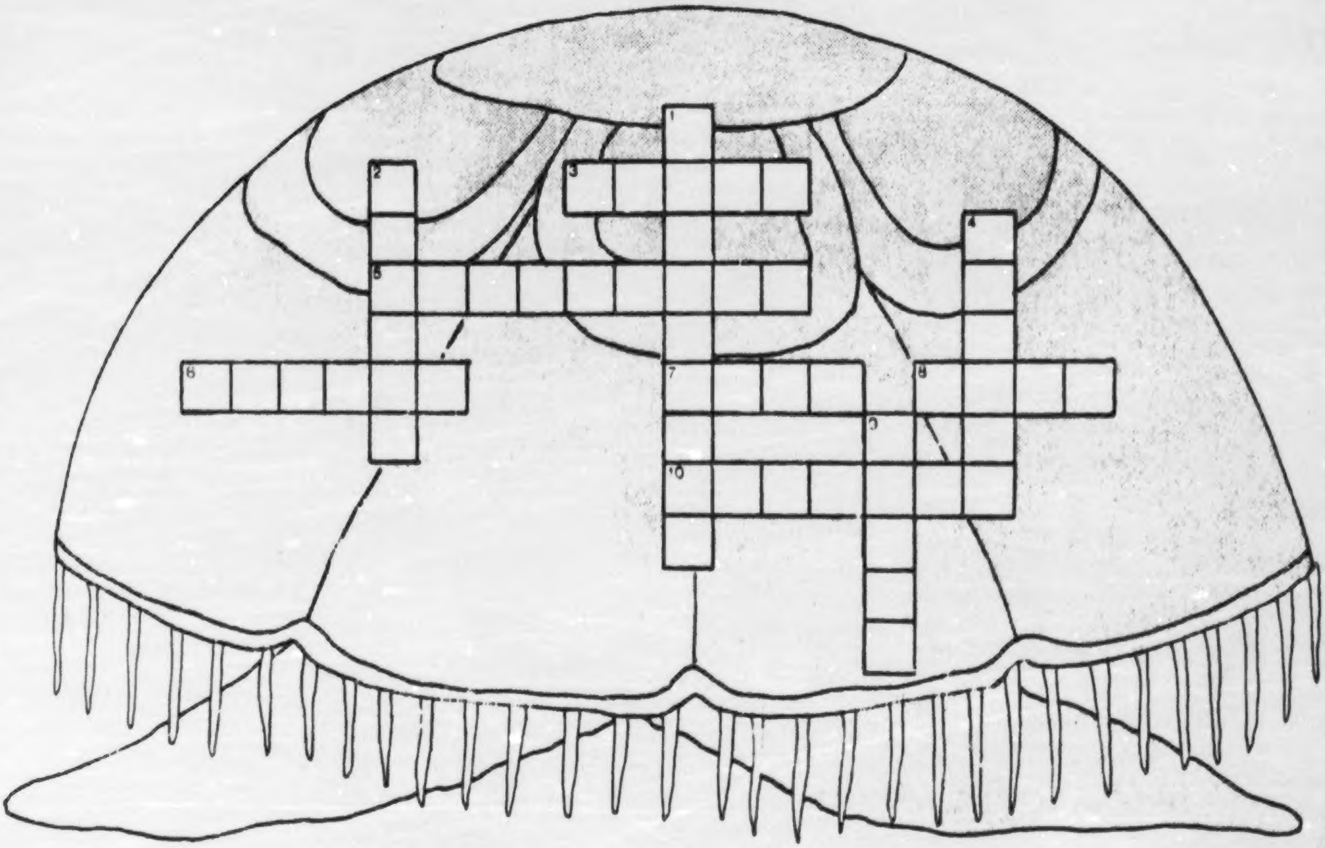
6. Glue long pieces of yarn, thread or strips of material to the inside of the cone.
7. Glue one long thread to the top of the jellyfish so that you can hang it up.
8. The class may wish to constuct a mobile from their jellyfish or simply hang them from the ceiling.





K-2b
15.2

It's a Jellyfish



ACROSS

3. Jellyfish live in the _______________.
5. The stinging part of the jellyfish is its __________.
6. The jellyfish has _________ in its tentacles that causes its food to stop moving.
8. If a jellyfish stings you, you may feel very _______________.
10. A relative of the jellyfish that is very harmful is the _______ ________.

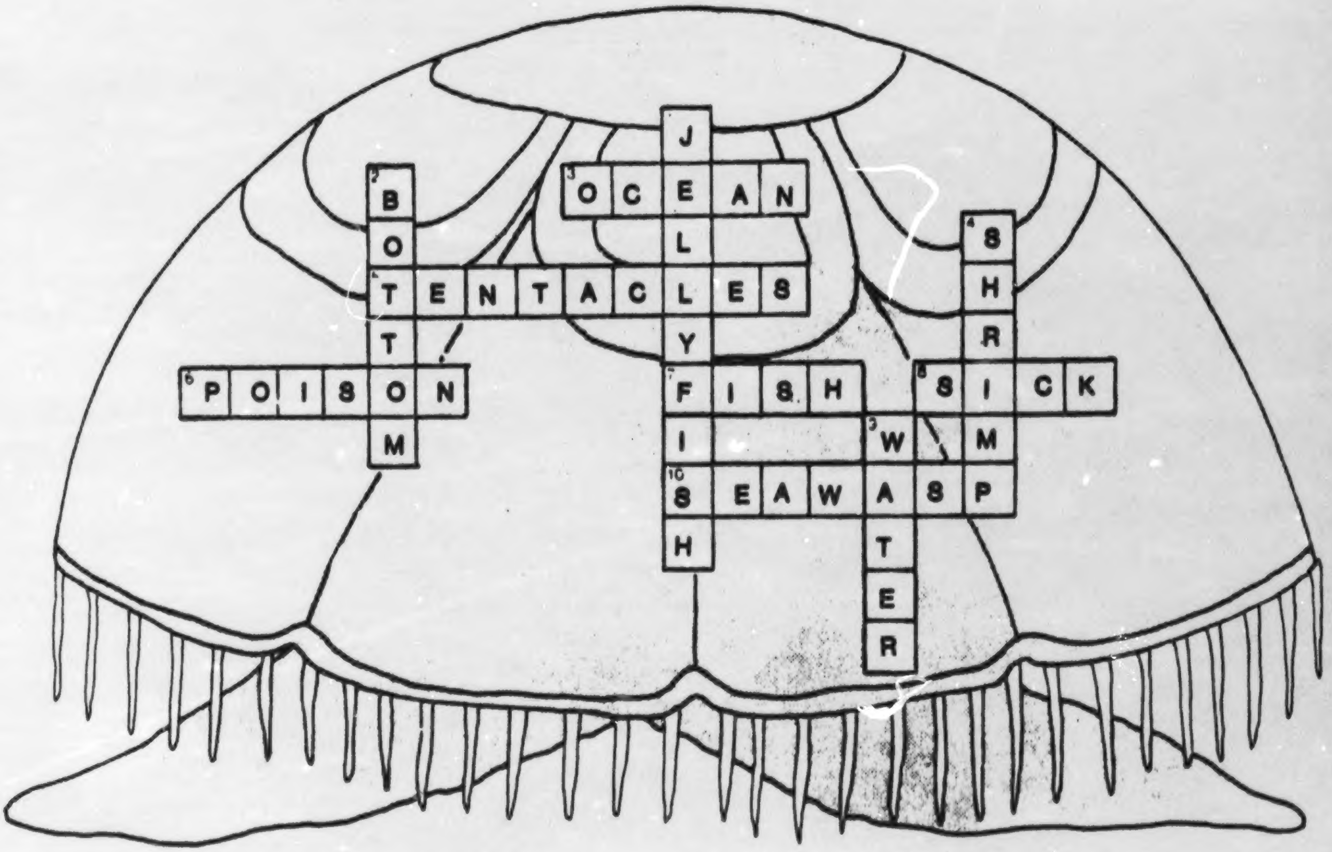
DOWN

1. An animal that looks like two plastic bags of water is the ______________.
2. The jellyfish's mouth is on the ____________ of the animal.
4. The jellyfish also loves to eat ________________.
9. The jellyfish's body is mostly ________________.

K-2b
15.3

It's a Jellyfish

(Answer Sheet)


J E L L Y F I S H
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3 O C E A N
4 S H R I M P
5 T E N T A C L E S
6 P O I S O N
7 F I S H
8 S I C K
9 W A T E R
10 S E A W A S P